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THE LANCET

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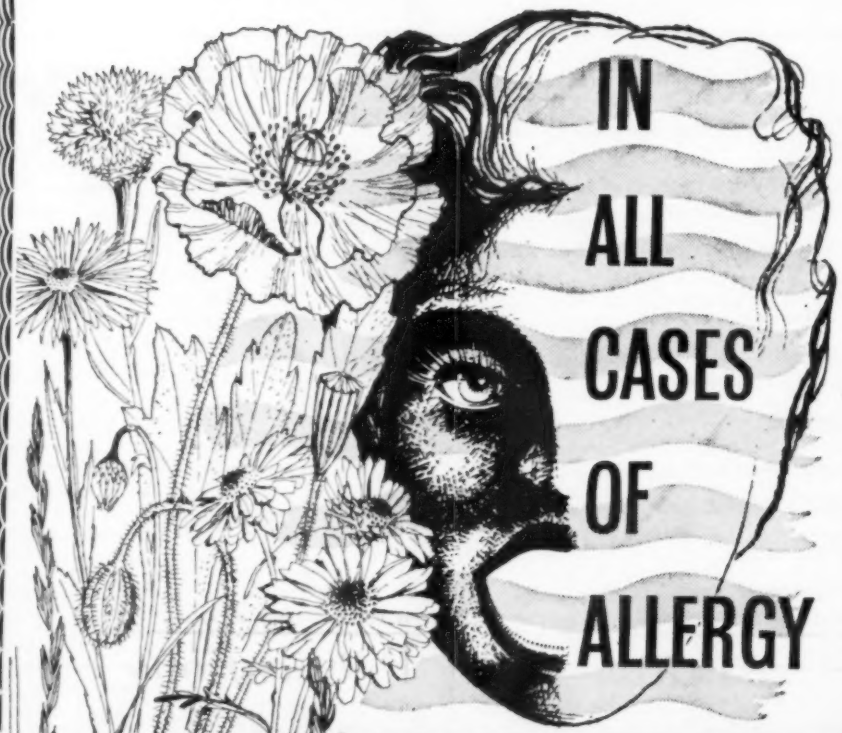

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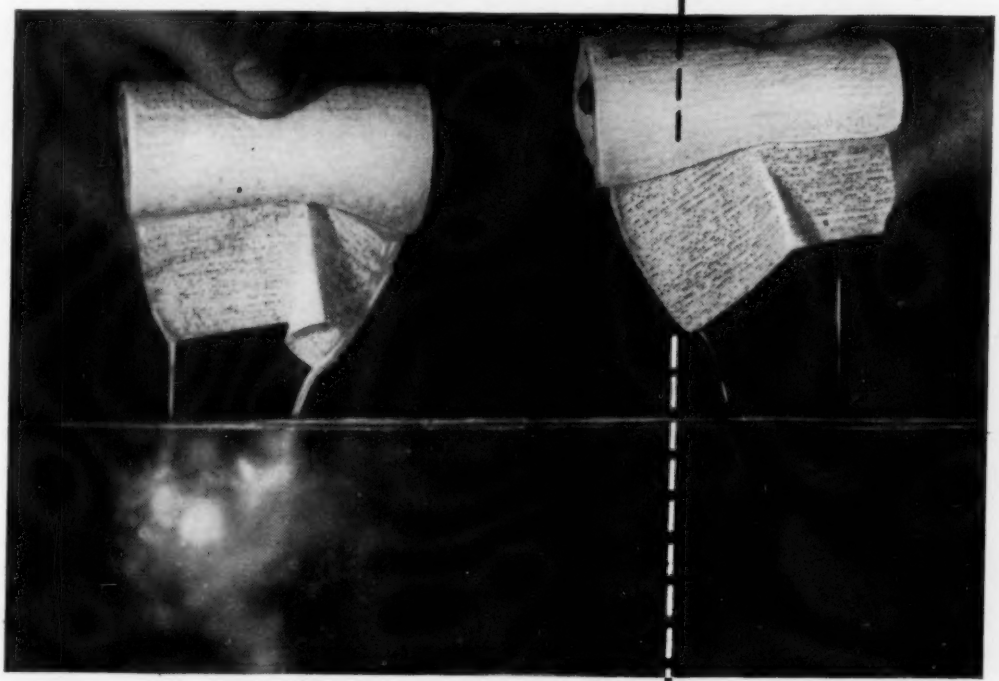

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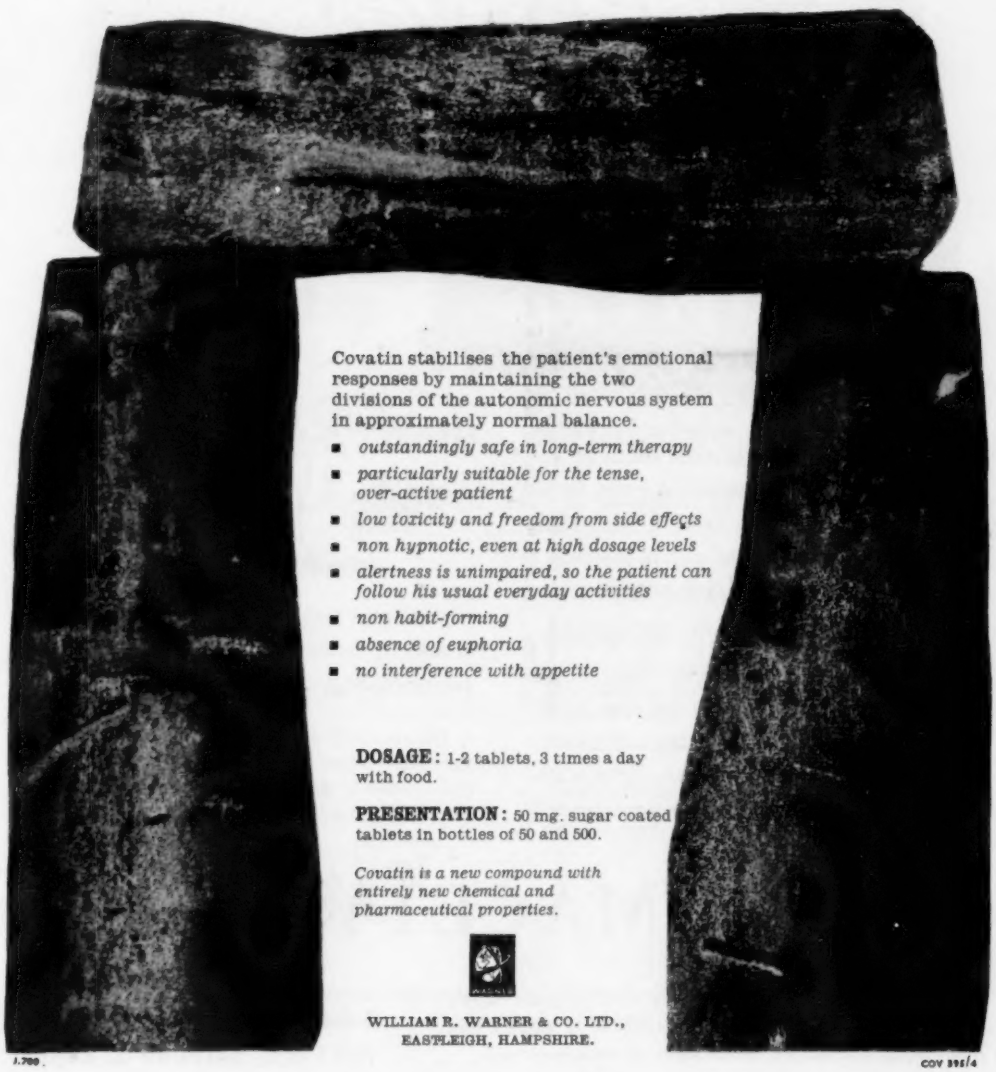

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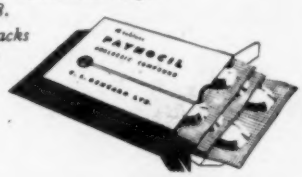

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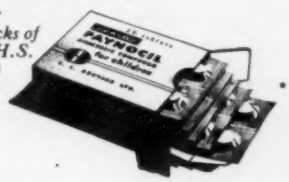

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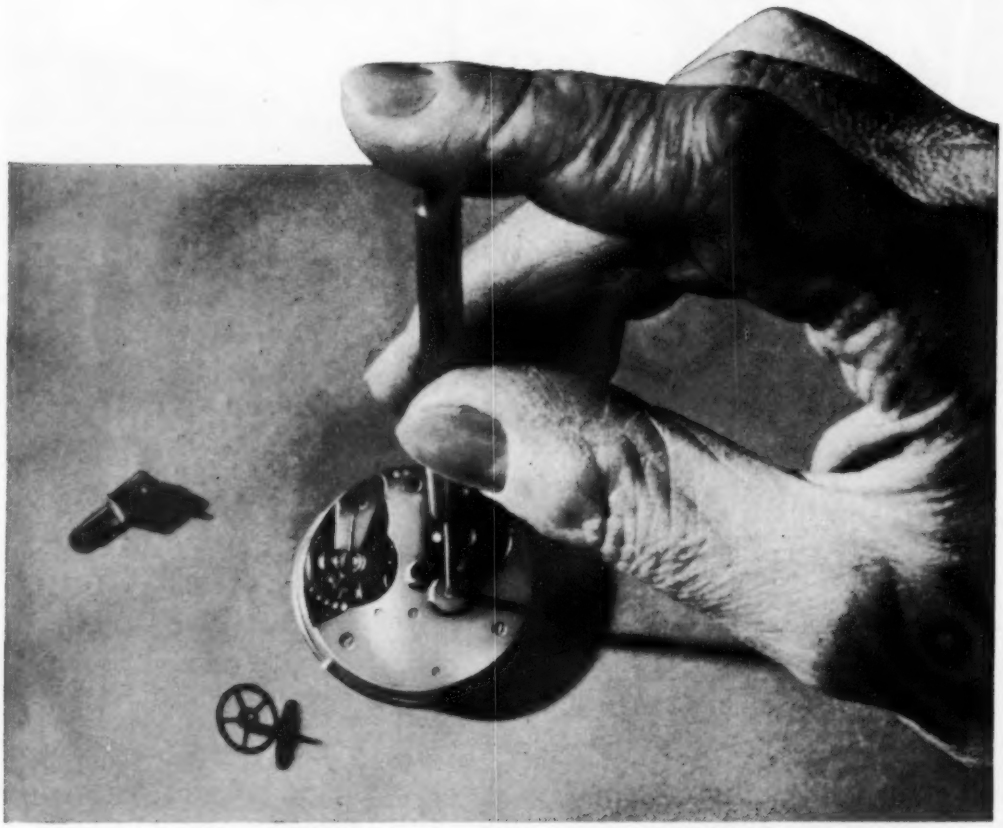

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[1] *Brit. med. J.* (1957) 2, 633

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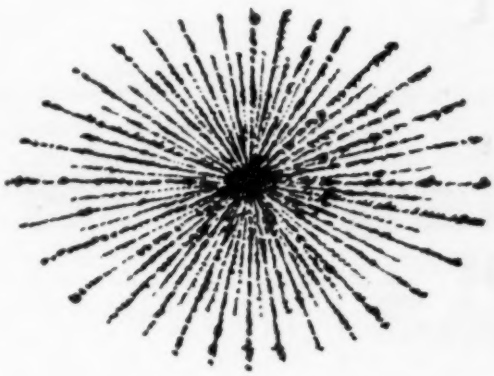

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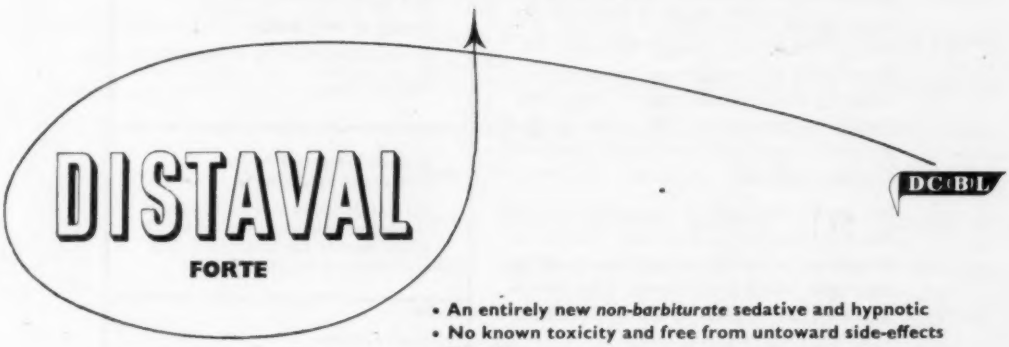

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1. *Amer. J. Obst. Gynec.* (1952) **63**:1361.
2. *Proc. Soc. exp. Biol.* (1953) **84**:491.

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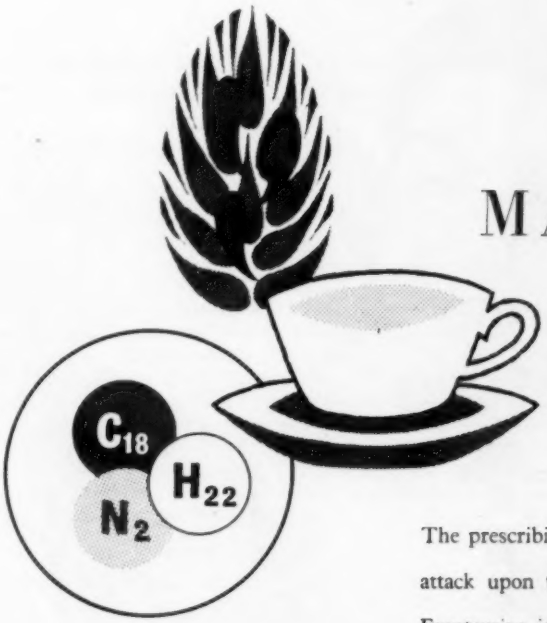

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PROGRESS IN THE CONTROL AND REDUCTION OF LEPROSY

Sir LEONARD ROGERS
K.C.S.I., M.D. Lond., LL.D. Glasg., F.R.C.P., F.R.C.S., F.R.S.

As the result of several years' research in Calcutta, I was able to record in 1917 that a number of fairly early cases of leprosy had been cleared of active symptoms by injection of a new soluble hydnocarpate of soda, which replaced the ineffective and nauseating oral administration of chaulmoogra oils (Rogers 1918). Up to that time the only plan in common use for controlling leprosy was the centuries-old compulsory segregation for life of all discovered cases. This drastic measure—unknown in modern times in the case of any other such chronic disease—had failed repeatedly to achieve its avowed purpose.

After my retirement from India I devoted three years to a comprehensive study of the previous fifty years' literature of leprosy (Rogers 1922) and formulated a plan of control (Rogers and Muir 1925–46).

Principles

Compulsory segregation failed because it led to the hiding of patients: in South Africa and the Philippines, where it was most rigidly enforced, cases were not notified until seven to nine years after the first appearance of symptoms. During this time of hiding they had infected members of their households and other close contacts, who carried on the disease indefinitely.

Moreover I obtained evidence that only a fifth to a fourth of all the cases were highly infectious—namely, the mucocutaneous type (to use the old but more descriptive term rather than the indefinite "lepromatous", which has come into use). Their infectivity is due to their sneezing and coughing myriads of lepra bacilli from their infected mucous membranes over highly susceptible and lightly clothed children of their households in humid, hot, insect-infested regions which constitute nearly all the areas of high incidence of leprosy (Rogers 1923). As the earliest symptoms of leprosy are found on exposed parts of the body, punctures of the skin by insects and abrasions afford entry for the bacilli, although the evidence is against direct inoculation by contaminated insects.

For these and other reasons I laid down the following principles of prophylaxis, which were adopted by the British Leprosy Relief Association (BELRA) shortly after its foundation in 1924, and have ever since been advocated by it.

(1) *Surveys of people in samples of leprosy-infected countries to determine extent of leprosy.*—The necessity for this measure is clearly shown by the fact that in India Muir found the true number of cases to be eight times the official ten-yearly census figures. A similar survey revealed the very unexpected number of 400,000 cases in Nigeria and 254,000 in British East Africa (Rogers 1955).

(2) *Only highly infectious mucocutaneous cases are in urgent need of isolation to stop new infections.*—The economic importance of this principle will be clear from the experience of South Africa (Rogers and Muir 1946, Rogers 1954). In that country segregation for life of all discovered leprosy patients has been enforced since 1892 without even preventing a steady increase of the disease due to hiding of the cases to avoid lifelong imprisonment without hope of successful treatment. But, when the value of hydnocarpate injections in early cases became known, patients in the early stages flocked voluntarily into the leprosarium for treatment. The medical authorities thought it necessary to continue compulsory segregation for all active cases because the disease was scattered over an immense area; but patients without active symptoms, chiefly with chronic neural leprosy, were released. The average duration of symptoms on admission fell from seven to two or three years, and the incidence of leprosy fell from 2·21 to 0·77 per 1000 by 1953. This notable success was obtained at a cost in some years of £250,000, or £100 per patient per annum; this only a gold-producing country could afford. But the accompanying table shows that over 700,000 cases require treatment in British tropical African territories compared to an average of less than 2500 under segregation in South Africa.

(3) *Voluntary isolation of all infective patients in special villages at very low cost.*—Soon after BELRA was founded, Lord Lugard, formerly Governor of Nigeria, told me that in South-East Nigeria it had been customary to isolate advanced cases of leprosy in special villages in which no uninfected people were allowed to reside. I therefore decided to revive this custom as the only economical plan of isolating the highly infective cases. This was later borne out by surveys revealing an estimate of 177,722 unisolated infective cases in British tropical African territories. Yet the recently constructed leprosarium in East Africa, with an attached research laboratory, cost BELRA alone £27,000 in capital and £4000 annually in upkeep.

(4) *Three-yearly surveys of contacts to detect newly developing cases in earliest easily curable stage.*—The necessity for this additional—and, I believe, previously unused—precaution may be illustrated by T. F. Davey's statement to me that on the third such survey of a tribe 7000 strong in South-East Nigeria, although not a single infective case was found, no less than 40 persons were discovered with very early symptoms which had appeared since the last survey. Such cases can now quickly be cleared up whereas formerly they would have become infective—probably long before they were segregated.

Trials of New Plan of Reducing Leprosy Incidence

Small-scale Trial in Nauru Island, Australia, in 1925

After consulting me, the Australian medical authorities made a survey of the small indigenous population of Nauru and found that nearly 30% showed signs of leprosy. Of the patients thus discovered, 90% were in a very early stage of the disease, but there were also some highly infectious cases. My plan was put into operation, and three years later Bray (1930) reported that the number of cases had been reduced by 40%. In 1934 Grant recorded a reduction by 66%. Moreover scarcely any of the early cases had gone on to reach an infective stage. Eighteen years later Wade and Ledowsky (1952) found only a seventh of the earlier numbers. The latest report, in 1957, shows only 47 cases, or 2·8 per 1000, of whom only 9 were isolated as infective.

INCIDENCE AND CONTROL OF LEPROSY IN BRITISH TROPICAL AFRICAN TERRITORIES

Territory	Known and estimated total cases						Infective cases				
	Population	Known cases under treatment	Estimated unknown and untreated cases	Total of known and estimated cases	Total cases per 1000 of population	Percentage of total cases under treatment	Infective cases isolated and treated	Infective cases unisolated and untreated	Total known and estimated infective cases	Percentage of infective cases isolated and treated	Estimated yearly cases infected from unisolated cases
Eastern Nigeria	8,000,000	28,237	54,000	82,237	10·3	34·3	15,572	5428	21,000	74·2	1084
Western Nigeria ..	6,000,000	8268	61,000	69,245	11·5	11·9	5242	12,058	17,300	30·3	2411
Northern Nigeria ..	16,800,000	17,266	250,000	267,266	15·9	6·5	11,310	55,390	66,700	17·0	11,078
East Africa	15,272,784	16,446	203,450	219,890	14·4	7·5	11,666	92,734	104,400	11·2	18,572
Gold Coast	5,000,000	14,860	50,000	64,860	13·0	22·9	860	12,112	12,972	6·6	2422
Total	51,072,784	85,077	618,450	703,498	13·8	12·1	44,650	177,722	222,372	20·0	35,567

Control Measures in Hyperendemic Areas of Tropical Africa

In 1923 I published a map of the world to show that nearly all the highest incidences of leprosy are met with in hot humid tropical and subtropical climates with annual rainfalls of 30–60 in. or more, especially in Africa, where later surveys showed that 86% of the leprosy patients for whom the British are responsible are found. This led BELRA to concentrate its main efforts on that hyperendemic region.

Progress in the control of leprosy in the British Commonwealth has been recorded (Rogers 1954, 1955), and the present position in tropical Africa is illustrated by the comprehensive data in the accompanying table.

The estimated yearly new infections from unisolated cases were estimated at a yearly rate of one child for every five highly infective cases in their households. This I regard as a conservative estimate in view of the fact that early cases are nearly always found in households containing an active mucocutaneous case.

The table shows that the rates per 1000 population vary between 10·3 and 15·9 in British tropical African areas. Yet those of 96 countries I worked out for three editions of *Leprosy* (Rogers and Muir 1925–1946) and later unrecorded ones show no such high incidence in extensive areas with high populations. For example, India in 1941 showed a rate of only 3·4 in spite of the number of cases having been estimated by surveys at eight times the census figure.

Nigeria presents the greatest leprosy problem in the world, with an estimate of 418,748 cases (see table). East African areas come a good second, with 219,890 in Uganda, Tanganyika, and Nyasaland, apart from Kenya, where suitable data are not available. The Gold Coast has an estimated number of 64,860 cases, making a grand total of 703,498 in the areas under consideration—about three-quarters of the probable total cases in British territories all over the world, after allowance has been made for underestimates in those of them which have not yet made surveys to determine the true numbers (Rogers 1954).

BELRA has concentrated on control measures of different degree according to local facilities as the most urgent task, beginning first in Eastern Nigeria, where alone it has maintained them long enough to produce material results, but also to a less extent in Western Nigeria, and only for the last few years in Northern Nigeria.

East Africa presents a difficult problem because the cases are scattered over a million square miles of territory. It was found advisable to contribute largely toward the cost of construction of a large leprosarium for 1000 infective cases, with a research laboratory.

In the Gold Coast it is only quite recently that vigorous efforts have been made to supply treatment to as many cases as possible at clinics situated at intervals of 10–15 miles along all the main and most of the subsidiary roads by a staff on bicycles over a territory of 91,000 square miles—all until recently under control of a single medical officer, Dr. A. Mackelvie. By this means 14,860 cases, or about 23% of the total estimated cases, are receiving regular treatment and many of them prevented from developing into a highly infectious stage.

That experience emphasises the importance of supplying a whole-time officer to take charge of leprosy-relief measures in any extensively infected area. BELRA has several times initiated such measures by offering to find half the salary of such a specialist medical man for a term of years.

Returning to the data of the three divisions of Nigeria we find that the progress made in the proportion of cases under treatment and the proportion of infective cases isolated and treated, and consequently the degree of control supplied, increases with the length of time during which the control measures have been applied. Thus the figures are highest (34·3% and 74·2% respectively) in Eastern Nigeria and lowest (6·5% and 17·0% respectively) in the Northern Division. Western Nigeria shows intermediate figures (11·5% and 30·3% respectively) but has the second highest figure of the whole table of infective cases isolated and treated. We must therefore turn to the work in Eastern Nigeria for evidence of any material reduction of the incidence of leprosy due to the modern measures of control.

Evidence of Material Reduction of Leprosy Incidence in Eastern Nigeria within Two Decades

When, as a result of the success of the small-scale leprosy-control measures in Nauru Island (see above) it was decided to conduct a large-scale trial in the Eastern Nigerian hyperendemic area, it was fortunate that the help of two successive medical missionaries was available. The economical village system of isolation was first introduced for the isolation and treatment of infective cases by J. A. Kinnear Brown (personal communication). His health broke down—although subsequently he was able to start the same measure in Uganda, and he was succeeded by T. F. Davey, who made careful surveys of all the people in different groups and repeated such surveys from time to time. Only a brief summary of his results (Davey et al. 1956) can be given here.

No less than 302 special isolation villages were constructed, "often at negligible cost and with the cooperation of the entire community". In one instance repeated surveys disclosed a reduction of leprosy from 31 to only 5 per 1000 in the eight years 1943–51. In another clan the disease almost completely died out within ten years. Many patients with tuberculoid leprosy were discharged in an inactive condition, but lepromatous cases rarely cleared up and then only slowly. Unstable "indeterminate" cases treated with hydnocarpus oil rarely degenerated into lepromatous leprosy. Through its action on such patients in particular hydnocarpus oil must have con-

tributed to the decline of leprosy. In this and contemporary trials striking results were recorded before sulphones became the standard treatment in Eastern Nigeria in 1951 in the form of oral dapsone. Davey et al. (1956) record that during the past six years a mass of evidence has accumulated of a decline in the incidence of the disease that is widespread and it is gaining in momentum each year. Thus, whereas in three provinces 30,630 patients with active leprosy were receiving treatment in December, 1948, by the end of 1954 the number had dropped to 14,770, a decline of 50%. Davey et al. discuss other possible causes of the great decline and conclude that they could have produced no such profound effects in the space of seven years. Moreover, during the last fifteen years about 30,000 patients, including most of the infective ones, have been isolated for longer or shorter periods in local segregation villages. Evidently the intense and widespread work for the control of leprosy has been of great importance in Eastern Nigeria.

Present Position of Sulphone Treatment of Leprosy

The discovery (by American leprologists at the Carville leprosarium in Louisiana) that sulphones are efficacious against leprosy is undoubtedly the greatest advance in the history of the disease. Lowe (1950), working for BELRA in Eastern Nigeria, was able to demonstrate the value of oral administration of the more economical mother sulphone dapsone, which could be used more easily on a large scale. The most important property of the sulphones is their effect in healing the lesions of the nose, throat, and larynx, and ulcerating nodes, and very greatly reducing their infectivity.

There remains the serious difficulty of getting rid of the immense numbers of lepra bacilli in the nodules. Sweetes (1955) records that, after three years' sulphone treatment of 800 lepromatous cases, in only 11% had the patient's tissues been freed from the bacilli. American leprologists therefore think it necessary to continue the treatment of such cases for years at great total cost.

Personally I very much doubt whether the comparatively few bacilli remaining deeply situated in subcutaneous nodules are likely to escape from the body in numbers constituting any material danger to other people. I therefore advise that, whenever numerous untreated and far more highly infectious cases are awaiting isolation, nearly cleared patients should be discharged from isolation to attend clinics and be bacteriologically examined from time to time for signs of relapse.

Further research for active drugs to supplement the sulphones is needed and is being pursued. Thus BELRA has originated and is financing such work in both West and East Africa. Any advances that may be made will bring nearer the day when leprosy will be virtually eliminated from the worst-infected areas of the world, by the measures so long advocated by me and now proved effective in the hyperendemic region of Eastern Nigeria.

Summary and Conclusions

A plan formulated in the 1920s for reducing the incidence of leprosy proved highly successful on a small scale in the island of Nauru.

The British Leprosy Relief Association, founded in 1924, helped to finance during two decades a large-scale trial of the new methods in highly infected Eastern Nigeria. As a result the incidence of leprosy there was materially reduced.

In the 1940s American leprologists discovered a new and potent remedy (especially in infective mucocutaneous, or lepromatous leprosy) in the sulphones. By the beginning of the present decade further researches in Nigeria had led to the simple and effective use orally of the mother sulphone, now known as dapsone.

Recent surveys in British tropical African territories have produced the estimated figure of 703,498 cases of leprosy, of which 85,000 (12%) are being treated in several hundred outpatient clinics, and 44,656 highly infective cases are isolated with treatment in three hundred special villages constructed for them at very low cost compared with large segregation settlements. Moreover, some promising new drugs have been tested in the research laboratories of West and East Africa to supplement the sulphones.

The way has thus been prepared for the steady reduction in the incidence of the ancient scourge of leprosy, probably nearly to the point of eradication—if only the essential additional staff and funds are forthcoming.

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INCIDENCE, ÆTIOLOGY, AND PREVENTION OF HEAT ILLNESS ON SHIPS IN THE PERSIAN GULF

C. S. LEITHEAD
M.B. St. And., D.T.M. & H.
LECTURER IN TROPICAL MEDICINE

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From the Liverpool School of Tropical Medicine

THE fabulously rich State of Kuwait exported some 56 million tons of oil last year. There is promise of a higher annual yield. Already, however, 230–240 tankers (and 14,000 or so sailors) call *each month* at Kuwait's Mina-al-Ahmadi (fig. 1) to load oil for world markets. In June, July, August, and September of each year this operation is carried out in environmental shade temperatures of 95–120°F (35–49°C) dry-bulb and 60–90°F (15–32°C) wet-bulb. Midsummer sun temperatures may exceed 160°F (71°C). In such circumstances the occurrence of heat casualties is not surprising.

The crews of ships sailing in the Red Sea, Gulf of Aden, and Persian Gulf have never been exempt from the effects of heat. Cases aboard Naval vessels in these and neighbouring waters have been described in recent years by McLean (1943), Stenning (1945), Thomson (1946) and Crowden (1951). Ellis (1955) considered that unreported heat effects had a serious impact upon the Fleet during the second world war.

We report here 128 cases of heat illness arising in the summer months of 1956 and 1957 among personnel of

Fig. 1—Oil pier, Mina-al-Ahmadi.

oil-tankers sailing in the Persian Gulf and calling at Mina-al-Ahmadi.

Patients and Methods

The pier at Mina-al-Ahmadi is provided with a clinic and heatstroke treatment room where the patients were first seen by the duty quarantine medical officer (Kuwait State health department). For further investigation and treatment, some patients were admitted to the Kuwait Oil Company hospital at Magwa, 15 miles inland.

Clinical impressions were augmented by estimations of chloride content of urine, whole blood, and plasma; sodium and potassium levels of whole blood and plasma; blood-urea level; and plasma specific gravity (methods after King 1951). Urine samples were first screened by the Fantus (1936) technique, and urine found to contain less than 3 g. of chloride per litre was further examined by the Volhard titration method.

The investigations were supported by a survey of acclimatisation and health of British, American, Arab, and Indian residents ashore, in the Kuwait Oil Company town of Ahmadi.

Environmental temperatures—e.g., in ship compartments—were measured with a sling hygrometer, and air movement with a katathermometer. Coastal temperatures in fig. 2 were derived from the Kuwait Oil Company marine department's meteorology station at Mina-al-Ahmadi, where the thermometers were mounted in a Stevenson screen.

Incidence

During the survey periods, June-September, 1956 and 1957, 1807 tankers berthed at Mina-al-Ahmadi, representing at most 108,000 seamen. Of those who required or sought medical attention on the pier, 128 were found to be suffering from the effects of heat. From these figures an approximate incidence index of 1 in 850 may be derived, but this is possibly not a true picture of the overall incidence of heat illness on ships in the Persian Gulf; we have no accurate information of the numbers seen and treated at other oil ports on the Gulf—e.g., at Abadan, Umm Said, or Dhahran.

TABLE I—CLASSIFICATION OF 128 CASES

Syndrome	No. of cases
Heatstroke	2
Heat hyperpyrexia	1
Borderline heat hyperpyrexia	5
Heat exhaustion syndromes:	
(1) " severe "	
Salt deficiency, with or without *heat cramps*	59
Anhidrotic heat exhaustion	1
Primary water deficiency	0
(2) " mild "	
Exercise-induced heat collapse; heat syncope; mild water deficiency; acute heat neurasthenia	60

Classification

Local physicians divide heat-illness into three groups—mild heat exhaustion, severe heat exhaustion, and heat hyperpyrexia (including heatstroke). Abundant clinical experience of heat effects, coupled with heavy outpatient sessions, makes further categorisation by laboratory investigation largely unnecessary and impracticable. In table I this simple division is correlated as far as possible with classification of the 128 cases according to the most recent proposals of the Medical Research Council's Climatic Physiology Subcommittee for nomenclature and coding of heat-illness (Weiner and Horne 1958).

Severe primary water-deficiency heat exhaustion, such as may occur in men lost in the desert, was not seen among the tanker personnel. Prickly heat and other skin disease referable to high environmental temperatures are not included in this table.

Clinical Observations

Complete absence of sweating and a rise in body temperature above an arbitrary level of 106°F (41°C) constitute *heat hyperpyrexia*—in the presence of environmental heat stress and the absence of any other cause of the pyrexia. If in addition the patient has coma, convulsion, or delirium, the condition is by common consent described as *heatstroke*. Choice of the arbitrary figure 106°F is unsatisfactory, and heatstroke with a body temperature of 105°F (40·5°C) is described in two cases by Leithead and Wilkinson (1958).

Of the 3 patients listed here, 1 was conscious but irrational with a body temperature of 106°F (41°C) and the other 2—British youths aged 22 and 24—had shown coma and convulsions with temperatures noted by intelligent lay observers to be 110°F (43·3°C) and 108°F (42.2°C) respectively. The issue in these two cases had been decided on board ship, before they reached medical attention: one recovered (without any apparent residual damage to the central nervous system) after being promptly put in the meat-storage space (the only " cool " compartment of this particular ship), and the other aspirated vomitus and died during correct treatment by applications of chilled water to the body and vigorous fanning to provide air movement.

Theoretically, it is inadvisable to apply ice chips or ice-cold water in these cases, because one may induce vaso-constriction which will prevent the blood from circulating through the cooled skin. But the successful use of a refrigerator by a resourceful ship's captain illustrates the fact that in practice advantage should be taken of any available cooling device.

In 5 patients the body temperature lay between 103° and 106°F (39·5–41°C). All were conscious and rational, and have been listed here as cases of *borderline heat hyperpyrexia*, a term used by Ladell et al. (1944). Of Ladell's 12 patients, 10 had anhidrosis when examined, whereas all our 5 were sweating. Urinary chloride excretion (Volhard technique) ranged from 3 to 11 g. per litre, and, in the 3 cases in which they were estimated, whole-blood and plasma levels of sodium, potassium, and chloride were within normal limits.

Anhidrotic heat exhaustion (thermogenic anhidrosis, tropical anhidrotic asthenia, heat exhaustion type II) as described by Wolkin et al. (1944), Allen and O'Brien (1944), and Ladell et al. (1944) was encountered only once. Horne and Mole (1950) and O'Brien (1948) have shown that four to seven months' exposure to a hot climate is usual before onset of this syndrome; and when they arrived at Mina-al-Ahmadi European tanker crews had seldom been exposed to heat stress for more than ten to fourteen days.

The patient listed here was an Indian, aged 36, who had travelled by passenger ship from Bombay to join an oil-tanker in the Persian Gulf. He was found to have extensive prickly heat with large areas of miliaria profunda and anhidrosis on the trunk; his temperature was 102°F (39°C), he had tachycardia and hyperpnœa, and he was sweating only on the face, hands, feet, and perineum. His urine contained 3 g. sodium chloride per litre.

Shortly after Sargent and Slutsky (1957), from a comprehensive review of the eccrine miliarias, concluded that natives of India are free from this syndrome, Jelliffe (1958) described it in Bengali children.

Our 59 cases of *salt-deficiency heat exhaustion* have been described in detail elsewhere (Leithead et al. 1958). They were distinguished from other exhaustion syndromes by the absence (or near absence) of urinary sodium chloride, with reduction of blood-chloride in cases thus investigated. Muscle cramps (heat cramps, miners' cramps, stokers' cramps) were noted in 60% of these patients, not in any of the other groups. No clinical purpose is served, we think, by separate classification of cramps, which are now believed to be directly caused by salt deficiency.

Unless there are muscle cramps, or the chloride levels of blood and urine are known, salt-deficiency heat exhaustion is not readily distinguishable from such conditions as exercise-induced heat collapse or acute heat neurasthenia. Generally, however, it is a more severe illness, culminating eventually in oligæmic shock, and most patients need several days' salt and water replacement and rest. 3 typical cases in this series required an average of 40 g. of salt by mouth before clinical improvement and the reappearance of urinary chloride in significant quantities (i.e., above 1 g. NaCl per litre).

Heat collapse (Dreosti 1937 and Weiner 1938) and *heat syncope* are allied circulatory disorders. Weiner observed syncope in Bantu miners who remained erect after exercise in a hot humid environment (wet-bulb temperature 94–95°F, or 35°C). In unacclimatised immigrants, during their first few days in a hot climate, sudden postural change may cause giddiness and even syncope. These disorders are attributed to extensive vasodilatation by direct action of heat, consequent " pooling " of the blood in the lower half of the body, postural hypotension, and hence inadequacy in the supply of blood to the brain. Giddiness, exhaustion, and headache are vague symptoms referable also to mild water deficiency, to acute heat neurasthenia, and to early salt depletion; and unfortunately they parallel the type of complaints chosen by malingerers. As operators of tanker fleets naturally aim at a quick turnround of their ships in port, close investigation and differentiation of patients with such mild symptoms was impossible. Our practice was therefore limited to separating the severe from the mild cases; but we can say that, though salt deficiency was found in a few patients with mild symptoms, it was invariably present in all severe exhaustion cases. Caplan (1943) also found low plasma-chlorides more frequently in clinically severe heat exhaustion.

Prickly heat was noted in 25% of all cases, and—except in the single case of anhidrotic heat exhaustion—it bore no apparent relation to the type of heat illness. No attempt was made to estimate its incidence in tanker personnel, but analyses by Smith (1957) of sickness returns for Naval vessels in the Persian Gulf in 1948–52 showed an incidence of skin disease (unqualified, but including prickly heat) of about 4%.

Ætiological Factors

Environmental Temperatures

To within 7-10 miles of the coast, Kuwait has a desert climate, but beside the sea the air is more humid, and readings taken at the shore end of the pier at Mina-al-Ahmadi reflect the climate experienced in the Red Sea and Persian Gulf. These readings are charted in fig. 2, along with saturation deficiencies and monthly incidence of marine heat illness for the survey periods. It is evident that, at high ambient temperatures, a sustained drop in saturation deficiency is associated with an increase in the amount of heat illness among tanker crews. This is mainly due to decreased evaporation of sweat and therefore decreased loss of heat in people whose acclimatisation is insufficient to take the extra heat load. Ashore in Kuwait the local physicians recognise that humid spells are liable

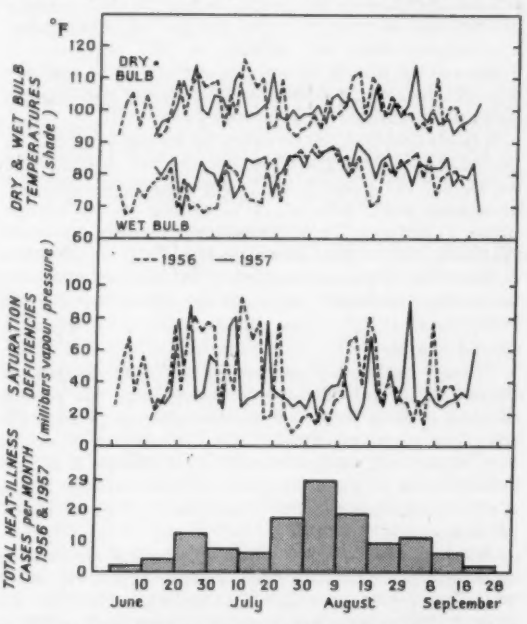

Fig. 2—Incidence of heat illness in relation to shade temperature (3 p.m.) and humidity readings during summer in Kuwait coastal area. Interrupted lines, 1956. Continuous lines, 1957

to cause heat syncope and collapse among previously healthy immigrant (non-European) workers.

Geographical

Heat casualties arise whenever environmental heat stress exceeds the level which is critical for the person concerned. They may therefore be encountered far from the tropics—e.g., in boiler rooms or coalmines. Cases of heatstroke in Britain recently reported by Harris and Hutton (1956) and Stoddart (1958) occurred in an operating-theatre and a Turkish bath.

But, although the geographical distribution is wide (Shattuck and Hilferty 1936), we may note that heat illness has always been a feature of Arabia and the Middle East (Friend 1932). By virtue of their poor acclimatisation, arduous duties, heavy equipment, and often unsuitable clothing, Western armies have suffered considerably in Middle Eastern areas. "The heat, and the fever" killed members of the Crusade of Edward I (Lindsay 1936). Among British Expeditionary Forces in Mesopotamia during the first world War, there were in one month no fewer than 425 deaths from heatstroke (Willcox 1920); but this harrowing experience of Willcox, and of Hearne (1919, 1932), resulted, through their wisdom, in improved diagnosis, treatment, and prevention, and so in an immediate reduction of mortality. The second world war again found unacclimatised troops suffering heat casualties in Iraq (Ladell 1944, Lipscomb 1944, Morton 1944, Croom 1944, Shepherd 1945). Between the wars Marsh (1930) gave a scholarly account of the ætiology and prevention of heatstroke among employees of the Anglo-Persian Oil Company, and Whittingham (1930) reported 26 severe cases among Royal Air Force personnel in Iraq.

Shipboard Occupation

As table II shows, occupation played a decisive part in the incidence of heat illness on board ship, which is about three times as common in the engine-room, and twice as common in the galley, as it is on deck. The 3 patients with heat hyperpyrexia and the 5 with borderline hyperpyrexia were all working in the engine-room. Figures in the middle column are derived by an assumption that the average tanker carries deck and engine-room crews and commissariat in proportion 3: 2: 1.

It is obvious that the occupational hazard is caused by the additional heat given out by engines, boilers, and ovens. Of 121 patients for whom records of shipboard occupation were obtained, 57% worked in the engine-room. Thomson (1946) found engine-room personnel providing 88% of heat illness on H.M.S. *Queen Elizabeth* in the Indian Ocean. Crowden (1954) observed the same occupational influence in a Naval ship in the Persian Gulf.

Acclimatisation

Though the word "acclimatisation" has enjoyed the dignity of several shades of meaning—e.g., the process of settling-down in a new environment, or perhaps the development of equanimity and temperance in face of the hazards and temptations of the Colonies, it is now falling victim to the harsh objectivity of the times and is used synonymously with the phrase "physiological acclimatisation to heat".

Adaptive physiological changes following exposure to unaccustomed heat have been studied extensively in the past twenty years or so (see Bass and Henschel 1956 and *Lancet* 1956). Present-day views may be summarised as follows. Exposure to heat causes vasodilation in skin and muscles, without immediate corresponding increase in blood-volume; and this results in cardiovascular instability, with pooling of blood in dilated vessels, and giddiness or syncope on exercise or sudden postural change. At this stage, the man is unfit for physical work in the hot environment. Adaptive changes include (1) retention of fluid, with an increase in blood-volume which restores cardiovascular stability; (2) a more rapid onset of sweating in response to a rise in body temperature; and (3) an actual increase in the rate of sweating. As a result of such changes, exercise in heat does not raise the heart-rate and body temperature so much as it did previously—i.e., ability to work in the new environment improves.

TABLE II—OCCUPATION OF PATIENTS ON BOARD SHIP

Occupation	All cases	Total at risk	Index
Engine-room	69	36,000	1 : 500
Deck	33	54,000	1 : 1600
Commissariat	19	18,000	1 : 900
Unrecorded	7	—	—

Agreement over the mechanisms of these changes has not yet been reached. But the salt retention and reduction in the chloride content of sweat which is seen in people on a low salt intake during the acclimatisation period (Conn 1949, Robinson et al. 1950, Weiner and van Heyningen 1952), and the fluid retention which must precede the rise in blood-volume, suggest that the adrenal gland is involved. There is already some evidence that urinary excretion of aldosterone rises during acclimatisation (Hellman et al. 1956).

Whatever the mechanism, the process is rapid and may be complete within a week. There may also be a long-term acclimatisation, developing over months or even years of residence in a hot climate; but to oil-tanker personnel visiting the Persian Gulf only the rapid changes are relevant. Sailing from Europe to Kuwait via Suez, they encounter high temperatures particularly after entering the Red Sea. After leaving the Suez Canal the modern tanker reaches Kuwait in ten or eleven days. By the time they arrived at Mina-al-Ahmadi, our patients had been ill on average for three to five days—i.e., their health had broken down within the usual acclimatisation period.

Although a few of the 128 were seasoned veterans of the Persian Gulf, 38 (30%) were making their first *summer* trip to it. As oil-tankers never tarry, either at loading or discharging ports, their crews continually pass from cool to hot climates and back. This may have a bearing on their state of acclimatisation, for Bean and Eichna (1943) found that in young fit men the acclimatisation conferred by one to three weeks' exposure to heat was retained fully for only two weeks. Tankers plying directly between Britain and Kuwait spend three continuous weeks in the heat but are then a further three weeks in a cool environment before being once more outward bound from Suez. Therefore on each trip to Kuwait their crew may be regarded as unacclimatised, or at least not fully acclimatised, to environmental temperatures east of Suez.

Diet, Fluids, and Salt

Critchley (1947) noted that sailors of H.M. Fleet preferred hot roast joints, potatoes, and suet puddings even in the Persian Gulf in summer-time. So do sailors in British oil-tankers today; and their preference cannot be unreservedly condemned. Ingestion of large carbohydrate or fatty meals increases the endogenous heat load, and if the meals are followed by work or exercise in high ambient temperatures, this increase may tip the scales in

favour of heatstroke. But diet by direction rather than choice can hardly be recommended for sailors already exposed to monotony.

Nowadays, the average tanker has water-cooling devices which supply chilled and palatable water in adequate quantities, and severe water-deficiency is not seen in the crews. Beer is not regularly available to British tanker crews while at sea, but Italian and French sailors are not denied their customary table wine. Heat illness occurred in a relatively high proportion of Italian ships, and of the 6 cases of borderline heat hyperpyrexia 3 were Italian. The association of heat hyperpyrexia with drinking too much alcohol is well known; but it is by no means invariable, and both our patients with heatstroke were British youths who had taken no alcohol at all before their collapse.

Body salt is derived from what is present in food or added to it. A diet containing meat offers approximately 10–15 g. of sodium chloride daily and in cool climates this is greatly in excess of human requirements. The salt habit has been criticised by Ladell (1957) as a luxury and addiction, and Dahl (1958) has suggested that long-confirmed dietary excess of salt may cause "essential" hypertension. Various ethnic groups have been cited as taking no harm from diets yielding less than 5 g. daily—e.g., Lapps, Eskimos, Indonesian peasants, South African bushmen, and North American Indians. Conn and Johnson (1944) showed that *fully acclimatised* Americans could perform hard work in a hot environment yet remain in salt balance on a total salt intake of 5 g. per day.

The sweat of unacclimatised man contains 2–5 g. of sodium chloride per litre: Conn (1949) puts the average as about 4 g. per litre. Hypothetical application of the predicted four-hour sweat rate (P4SR) scale of McArdle el al. (1947) for young, fit, acclimatised men undertaking moderate work in overalls, to dry-bulb and wet-bulb temperatures and air-speeds recorded by one of us (C. S. L.) in the engine-room of a tanker in the Red Sea and Persian Gulf in May, 1956, suggests a loss of up to 6 litres, or more, during a four-hour watch. As the engineers under observation could not have been fully acclimatised, and the actual sweat rates were therefore probably lower than calculated, salt losses may be put at 12–16 g.; or more, in the four hours. The experiments of Conn and of others show that in acclimatised men on a low intake of salt the salt content of the sweat may drop to less than 0·5 g. per litre, thereby "saving the day," but the high incidence of salt deficency (46%) among our 128 patients suggests that dietary salt intake was inadequate for the circumstances and that in some individuals reduction of the salt content of the sweat had not developed in time to avert onset of the deficiency state.

Sex and Age

Among 302 cases of heat illness among civilians during heat-waves in Chicago, Cincinnati, and St. Louis, males outnumbered females by 238 to 64 (Gauss and Meyer 1917, Ferris et al. 1938, Austin and Berry 1956). But the sex incidence is of no significance to Persian Gulf shipping, for only a few of the gentler sex sail in tankers—as laundresses or stewardesses. At Mina-al-Ahmadi 4 complained of giddiness, headache, and fatigue; but none were febrile or salt-deficient.

The 128 patients ranged in age from 15–65 years but 70% were between 18 and 40. This merely reflects the age pattern of the sailors at risk. Service personnel and other young men working hard in a hot environment suffer heat illness despite their youth: thus of 733 cases reported from such communities, 90% were below 40 years of age (Wallace 1943, Caplan 1943, Borden et al. 1945, Malamud et al. 1946), whereas when the wide age-range civilian populations of Chicago, Cincinnati, and St. Louis (vide supra) were exposed to heat stress 80% of casualties were above the age of 40. The inference seems to be that increasing age, with the onset of degenerative diseases such as arteriosclerosis, coupled possibly with an increase of the body-mass/surface-area ratio (which to some extent influences efficiency of heat loss), increases susceptibility to heat illness.

Nationality

The racial distribution of the patients—again corresponding to that of the sailors at risk—was: British 35, Italian 19, Norwegian 16, German 14, Greek 14, French 11, Dutch 7, Indian 5, Chinese 3, Swedish 2, Spanish 1, and American 1.

Over the survey periods, the national flags which contributed the greater bulk of the shipping were: British (391 tankers), Norway (363), Liberia (348); France (124), Panama (115), and Italy (100). Since tankers flying the so-called flags of convenience (e.g., Liberia, Panama) carried mixed crews including Italians and Greeks, an index for nationality incidence is not calculable from these figures. However, the proportion of ships of each flag which provided cases of heat illness may cast some light on the influence of shipboard factors: Italian 9%, Panamanian 8%, Liberian 7·5%, British 7%, Norwegian 6%, and French 4%.

The fact that unacclimatised Caucasians fall victims to heat illness more often than people who live in hot climates has somewhat clouded Western medical teaching on the subject. For example, a current British textbook of medicine says that prickly heat is peculiar to white races, whereas in fact Indians and Arabs are by no means exempt. The truth is that, whereas acclimatisation is important, nationality, per se, is not.

General Health

Syphilis, virus pneumonia, enteritis, appendicitis, and malaria complicated 7 of the 128 cases. In a hot environment, infection and gastrointestinal upsets carry an extra risk because fever, anorexia (with reduced water and salt intake), or vomiting and diarrhœa (with increased loss of water and salt) predispose to heat illness.

Prevention

Pickering (1958) quotes Bertrand Russell to the effect that whereas in older civilisations man adapted himself to his environment, the modern American adapts the environment to suit himself. In the desert hinterland of Kuwait, nomadic Bedouins wear long robes to protect themselves from the fierce heat, and during the hottest part of the day they rest in meditative immobility in the shade of their tents. Beside them, the Western oil-company staff wear light clothes, and display health and vigour in contempt of the same heat—but are able to return periodically to bungalows which are supplied with fans, air-conditioning systems, and refrigerators.

In tankers in the Persian Gulf, prevention of heat illness depends on a compromise between these two concepts. In many such ships, sickbays and messing saloons have been provided with individual air-cooling units, and some of the newer tankers have cabin air-conditioning. Ideally, temperatures in resting quarters should be within the range of human *comfort*, and in working spaces within

the levels of human *tolerance* to heat. In the summer heat of Kuwait, Europeans feel comfortable and sleep well in rooms cooled to about 78°F (25°C) dry-bulb temperature, and this agrees with figures published for Europeans in similar climates; but it is harder to be dogmatic about upper tolerable limits of environmental warmth for men who are working—except in terms impracticably low for ships' engine-rooms in tropical waters.

Information on heat tolerance has been reviewed by Bedford and Tredre (1955), and in relation to prevention of heat incapacitation by Ellis (1955). Several physiological indices of heat stress have been evolved but are too complex to be useful to officers of the mercantile marine.

The *American effective temperature scale* (E.T.), which takes into account the temperature, moisture content, and movement of environmental air, was modified by Bedford (1946) to allow for radiant heat in engine-rooms and boiler-rooms, and has been in wide use in the Services—U.S. and British. Weiner and Lind (1955) suggested that acclimatised men are capable of hard work at E.T. 90–91°F; but for unacclimatised men the maximum figures quoted have not exceeded E.T. 86°F.

Wet-bulb (W.B.) readings are also of value. Haldane (1905) suggested an upper endurable limit of W.B. 88°F (31°C) for men working in air movement of 150 feet per min. Caplan (1943) encountered heat casualties in the Kolar goldfield whenever the wet-bulb temperature rose above 90°F (32°C), and Eichna et al. (1945) observed that work became impossible for young fit and acclimatised men in saturated air at W.B. 96°F (35°C).

Dry-bulb (D.B.) readings unaccompanied by knowledge of humidity are less useful in assessing tolerance. Even in very dry heat the degree of air movement and the duration of exposure, age, acclimatisation, clothing, and activity of the person exposed are all factors of considerable influence. Thus Shickele (1947) found that "heat death" conditions certainly prevail when maximum daily temperatures exceed D.B. 113°F (45°C), while Blagden (1775) and his colleagues exposed themselves to a room temperature of dry-bulb 260°F (127°C) for eight minutes without ill effect.

In summary, heat casualties among young working men who may not be fully acclimatised can be predicted at wet-bulb readings above 90°F (32°C) at sustained dry-bulb readings above about 110°F (43°C) and at above 86°F on the effective temperature scale. But there seems to be little advantage in recommending that working spaces in ships in tropical waters be kept below these temperatures if in practice this is unlikely to be possible. During the late war it was recommended that in British warships in the tropics the effective temperature should not exceed 86°F; but in August, 1951, effective temperatures in the engine-room of one such vessel in the Persian Gulf were between 90 and 95°F (Crowden 1954), and in May, 1956, in the engine-room of a tanker in the Red Sea and Persian Gulf they varied between 85 and 93°F —with no scarcity of old hands to aver that this was mere child's play and that the "real" heat would begin in July.

In such circumstances, heat illness can be prevented only if tanker personnel make concessions to the environment; and if they are to do this they must be told what is necessary, and why it is necessary. Minard et al. (1957) have shown how the incidence of heat casualties among Service recruits was reduced by limiting certain activities during periods of excessive heat.

Captains, chief engineers, and other responsible officers should be aware, for example, of the vague premonitory symptoms of heat distress, and should know that if the environmental heat is barely tolerable to a man standing a four-hour watch, such a man is certainly incapable of performing hard work in the same environment for that period. Completely unacclimatised apprentices, assistant engineers, and other "first-trippers" should not be allowed to judge their own capabilities, for some are too brave. Both the heatstroke patients reported here were making their fist trip to the Persian Gulf; and one, who was fortunate to survive, developed hyperpyrexia and coma after working for about an hour on electrical repairs in a space above the boilers where the temperature (recorded *after* the event) was D.B. 180°F (82°C).

Considerably more attention to salt intake is also required. This is reiteration of advice which has often been given without the desired effect; for Thomson (1946) found primary salt-deficiency accounting for 89% of heat-illness cases on a troopship, Marriott (1950) regarded salt-deficiency in tropical countries as "perhaps the commonest of all deficiency states", and Crowden (1954) advised an intake of about 30 g. of salt daily for engine-room personnel at sea in the Persian Gulf in summer months. This figure seems to us rational, and implies the addition, at table, to daily food of three unheaped teaspoonfuls of salt (or eighteen enteric-coated salt tablets, each containing 0·65 g.).

Finally, in the Red Sea and Persian Gulf people suffering from anorexia and nausea should not be encouraged to cease intake of food, water, and salt, as seems to be usual. And drugs carried by ships in these waters for treatment of gastrointestinal upsets should not contain atropine, which inhibits sweating.

Summary

A vast international fleet of oil-tankers now sails in the Persian Gulf, and heat illness aboard the ships is a serious problem, 128 such cases seen at one port in the summer of 1956 and 1957 are reported, among which were 3 cases of heat hyperpyrexia (1 fatal), 5 of borderline heat hyperpyrexia, 59 of salt-deficiency heat exhaustion, 1 of anhidrotic heat exhaustion, and 60 of minor heat syndromes (unclassified). A large proportion of these cases occurred in the month of August each year.

Tanker crews going to the Persian Gulf are exposed to heat especially in the ten days after they leave the Suez Canal. During this period they have to become rapidly acclimatised, or regain the acclimatisation lost after their previous voyage. The additional heat-stress of engine-rooms and galleys accounted for over half the cases.

If heat illness is to be prevented aboard such vessels, responsible officers must have fuller understanding of the risks. Crews must be induced to take supplementary salt in quantities sufficient to replace what they lose in sweat; and officers must be readier to limit activity before it becomes dangerous. For saving lives and safeguarding health these personal preventive measures are almost as necessary as maximum air-conditioning of the ships.

We wish to express gratitude to our many colleagues in Kuwait; to Dr. Eric Parry, F.R.C.S., chief of Kuwait State Medical Service, for permission to investigate patients of the State clinic on Mina-al Ahmadi pier; and to Mr. C. A. P. Southwell, C.B.E., M.C., managing director of the Kuwait Oil Company.

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BRIDGE ANTICOAGULANT IN VON WILLEBRAND'S SYNDROME

JOHN F. WILKINSON
M.D., M.Sc., Ph.D. Manc., F.R.C.P., F.R.I.C.

F. NOUR-ELDIN*
M.B. Cairo, Ph.D. Manc.

M. C. G. ISRAËLS
M.D., M.Sc. Manc., F.R.C.P.

From the Department of Hæmatology, Royal Infirmary and University of Manchester

Von Willebrand's syndrome is a familial hæmorrhagic disease that has some clinical features resembling true hæmophilia but differs significantly in other ways. Thus disproportionate bleeding from minor injuries appears in childhood and removal of teeth or tonsils can cause serious bleeding. But in von Willebrand's syndrome males and females are equally affected; the blood-clotting time is normal, but the bleeding-time is prolonged. For these reasons the syndrome has been called "pseudo-hæmophilia" or "vascular hæmophilia".

It is not very uncommon; Buchanan and Leavell (1956) traced 186 published cases and added 13 of their own. While investigating their own patients with contemporary techniques they found that the prothrombin-consumption test was abnormal in 5 of 6 tested. Later, Singer and Ramot (1956) applied the thromboplastin-generation test to the blood of a patient with pseudohæmophilia and showed that there was a deficiency of antihæmophilic globulin, thus confirming the report of Alexander and Goldstein (1953). Reports of antihæmophilic globulin deficiency in von Willebrand's syndrome have since been published by Matter et al. (1956), Nilsson et al. (1957), and Fessey and Meynell (1957) among others. Biggs and Macfarlane (1958) estimated the antihæmophilic globulin deficiency in 15 members of eleven families with the disease, and in 11 of them the antihæmophilic globulin level was reduced to levels between 1·6% and 45%.

Nour-Eldin and Wilkinson (1958a) have described a blood-clotting inhibitor in the plasma of all patients with true hæmophilia or Christmas disease and called it the Bridge anticoagulant after the first patient. Since this factor seems to be part of the inherited abnormality of the hæmophilia syndrome, its presence could be used to see if von Willebrand's disease was a member of the hæmophilia group or not. For this purpose three patients with typical von Willebrand's disease were studied.

* Research Fellow in Hæmophilia, United Manchester Hospitals.

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Case-reports

Since the three cases have not previously been published, brief clinical notes are given here.

Case 1.—A girl, aged 7 years, was referred for investigation with a history of excessive hæmorrhage after trauma. No other members of the family were known to be affected, and blood from her parents and a brother, aged 14, was normal. At the age of $2^1/_2$ years she "cut her tonsil on a sweet"; there was profuse bleeding, her hæmoglobin fell to 20%, and she had to be transfused. Since then she had had to be transfused on eleven occasions for bleeding after tooth extractions or epistaxes following trauma or infection. Large bruises appeared after quite small bumps, but none of the hæmorrhages seems to have been spontaneous. The results of blood tests (tables I

TABLE I—BLOOD-CLOTTING TESTS ON PATIENTS WITH VON WILLEBRAND'S SYNDROME

Test *	Normal range	Case 1	Case 2	Case 3
Blood-clotting time (min.)	4–7	5	5	7
One-stage prothrombin-time (sec.)	11–12	12	12	12
Prothrombin - consumption index (%)	Below 40%, usually below 10%	28	10	10
Bleeding-time (min.)	2–4	20	$7^1/_2$	$10^1/_2$
Platelets per c.mm.	200,000–400,000	239,000	322,000	186,000
Clot retraction (%)	48–64	54	57	50

TABLE II—THROMBOPLASTIN-GENERATION TEST

Effect of various plasmata on formation of plasma-thromboplastin from patients' plasmata

Source of $Al(OH)_3$-treated plasma (1:5)*	Substrate (normal citrated plasma) clotting-time (sec.)†		
	Case 1	Case 2	Case 3
Patient	$33^1/_2$	$16^1/_2$	24
Patient—after being mixed with 10%:			
(i) Phenindione plasma‡	$15^1/_2$	13	15
(ii) Christmas-disease plasma	16	14	15
(iii) Hæmophilic plasma with low level of Bridge anticoagulant	30	$16^1/_2$	25
(iv) Hæmophilic plasma with high level of Bridge anticoagulant	$39^1/_2$	19	$27^1/_2$
(v) Normal plasma	15	$12^1/_2$	14
Normal (control)	9	9	9

* Equal volumes of diluted 1:5 $Al(OH)_3$-treated plasma, platelet suspension, normal diluted 1:10 serum, imidazole buffer pH 7·3 and 0·025*M* $CaCl_2$ were mixed together at 37° C for 6 minutes.

† The activity of the plasma-thromboplastin formed in the incubation mixture was tested by taking 0·1 ml. thereof and adding it together with 0·1 ml. 0·025*M* $CaCl_2$ to 0·1 ml. normal citrated plasma (substrate) recording the clotting-time.

‡ Patient receiving phenindione with one-stage prothrombin-time of 25 sec. (normal 11 sec.).

and II) show the typical combination of prolonged bleeding-time and normal clotting-time with normal platelet-count; the thromboplastin-generation test gave results showing a deficiency of antihæmophilic globulin. The patient was admitted to hospital for removal of two teeth, and three transfusions in nine days were needed to control the bleeding. She has had three further admissions for control of bleeding from her nose, her tonsillar bed, and her gums.

Case 2.—A boy, aged 8 years, had had frequent epistaxes for five years, sufficiently severe to need blood-transfusion on one occasion. He bruised excessively after minor trauma. His joints were not affected. His father bled unduly after tooth extractions; other members of the family were unaffected; his mother's blood was normal. The results of laboratory tests with this patient's blood (tables I and II) show the same combination as in case 1, but the deficiency of antihæmophilic globulin was less severe.

Case 3.—This boy, aged 11 years, was referred from the Dental Hospital with a history of excessive bleeding after tooth extractions. At the age of 5 years removal of a milk tooth had caused severe hæmorrhage, and a blood-transfusion had to be given. When he was 7 years old he had two weeks in hospital after tooth extraction, but the bleeding was controlled without transfusion. He also bruised excessively after minor trauma. No other members of the family were significantly affected, and no clotting anomaly was found in his mother's blood. Laboratory tests with his blood gave results very similar to those of the two other patients.

Methods

Blood-clotting tests.—These were made essentially as described by Biggs and Macfarlane (1957); imidazole buffer pH 7·3 was added to the incubation mixture in the thromboplastin-generation test.

Bridge anticoagulant.—To determine whether or not this blood-clotting inhibitor was present in the plasma, the method described by Nour-Eldin and Wilkinson (1958a) was used. In this method undiluted aluminium-hydroxide-treated plasma is used in the incubation mixture, and the activity of plasma thromboplastin formed is tested on normal as well as patient's citrate-plasma substrate.

Results

Table I shows that the three patients had blood-clotting times, one-stage prothrombin-times, prothrombin-consumption indices, and clot retractions within the normal ranges, but they had prolonged bleeding-times. Hess test (capillary fragility) at a pressure of 80 mm. Hg for five minutes gave positive results in all instances. The nail-bed capillaries, however, showed no abnormality when seen magnified 20 times by Zeiss binocular. Paper electrophoresis, using barbitone buffer pH 8·6, showed normal bands for the serum-proteins.

The results of the thromboplastin-generation tests are shown in table II. Antihæmophilic globulin was deficient in the plasma of all the patients, but the serum factors were normal. The patients' platelets were fully active when used in this test. Table II also shows the effect of mixing each patient's plasma with plasma from another source; the generation of plasma-thromboplastin is much improved on adding plasma from sources other than hæmophilic patients. Furthermore, the addition of antihæmophilic globulin separated from pig's plasma (Bidwell 1955) corrected the defect.

The results of testing for Bridge anticoagulant are shown in table III. In this test the technique of the thromboplastin-generation test is used, and the clotting-times of the citrate-plasma substrate, using either normal plasma or the patient's plasma, are compared. In hæmophilia the clotting-time with patient's-plasma substrate is longer than with normal substrate, and the difference is greater on using undiluted $Al(OH)_3$-treated plasma in the incubation mixture (Nour-Eldin and Wilkinson 1957, 1958a). Table III shows that no such differences were found in any of the three patients; therefore Bridge anticoagulant was absent.

TABLE III—TEST FOR BRIDGE ANTICOAGULANT

Case	$Al(OH)_3$-plasma in incubation mixture	Substrate clotting-time (sec.)†	
		Normal plasma substrate	Patient's-plasma substrate
1	Diluted 1:5	34	34½
	Undiluted*	34½	33
2	Diluted 1:5	15½	17
	Undiluted*	14	14
3	Diluted 1:5	24	24½
	Undiluted*	20	20

* Undiluted $Al(OH)_3$-treated plasma was used in the incubation mixture; 0·05*M* instead of 0·025*M* $CaCl_2$ was added; otherwise reagents were the same as in table II.
† Same procedure as in table II.

Discussion

When a deficiency of antihæmophilic globulin was found in the blood of patients with von Willebrand's syndrome, the link with hæmophilia was apparently strengthened; but our demonstration of the absence of Bridge anticoagulant distinguishes it from both classical hæmophilia and Christmas disease, and fits in with the different type of inheritance and the really different clinical picture. In view of this distinction we think that the name "vascular hæmophilia" should not be used. "Pseudohæmophilia" seems to be more suitable because it at least indicates that there are resemblances to hæmophilia, notably as regards the deficiency of antihæmophilic globulin. Unfortunately pseudohæmophilia is rather a vague title, having been used as a synonym for many blood-clotting defects and vascular abnormalities which bear some clinical resemblance to classical hæmophilia but differ from it in certain laboratory or genetic aspects. Another reason for avoiding the use of this title is apparent from the present work; unlike classical hæmophilia, the plasma of these patients is devoid of Bridge anticoagulant. Accordingly we prefer to report these cases as "antihæmophilic-globulin deficiency associated with capillary defect". So long as this deficiency is present, it is clear that, for treatment of continued bleeding, fresh blood—i.e., blood within two hours of being drawn from the donor—or antihæmophilic factor concentrate should be used; in the absence of the antagonistic Bridge anticoagulant the therapeutic effect should be good.

The finding that the platelets were normal in number, morphology, clot retraction, and activity in the generation of plasma-thromboplastin indicates that faulty capillaries are most probably the cause of prolonged bleeding-time. With the methods available at present we could not detect the true nature of the defect producing this anomaly in our patients. It may be due to a histological abnormality.

It is remarkable that no hæmarthrosis or spontaneous visceral bleeding developed in the three patients reported here, in spite of their having a prolonged bleeding-time and increased capillary fragility, thus confirming the observation of Nour-Eldin and Wilkinson (1958b) that these manifestations are related to the concentration of Bridge anticoagulant rather than the level of antihæmophilic globulin.

Summary

Three cases of von Willebrand's syndrome, so-called pseudohæmophilia, are briefly described; a deficiency of antihæmophilic globulin was found in their plasma.

The Bridge anticoagulant, present in true hæmophilia and in Christmas disease, was absent from the blood of these patients.

It is suggested that von Willebrand's syndrome is a distinct entity and is not a variety of classical hæmophilia; it should be considered as a deficiency of antihæmophilic globulin associated with capillary defect.

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KLINEFELTER'S SYNDROME: GENETIC STUDIES

JOHN S. S. STEWART
M.B. Glasg.
SURGICAL REGISTRAR, EASTERN DISTRICT HOSPITAL, GLASGOW

M. A. FERGUSON-SMITH
M.B. Glasg.
SENIOR HOUSE-OFFICER

BERNARD LENNOX
M.D. Durh., Ph.D. Lond., M.R.C.P., F.R.F.P.S.
SENIOR LECTURER

DEPARTMENT OF PATHOLOGY,
UNIVERSITY AND WESTERN INFIRMARY, GLASGOW

W. S. MACK
M.B. Glasg., F.R.C.S.E., F.R.F.P.S.
UROLOGIST, UNIVERSITY AND WESTERN INFIRMARY, GLASGOW

IT is now well known that many cases of Klinefelter's syndrome are chromatin-positive by Barr's method of nuclear sexing, and it is generally accepted that the finding of chromatin-positive nuclei indicates the presence of the female pair of XX chromosomes (Lennox 1956); hence these apparently very nearly normal males are "genetic" females with sex reversal.

There has been much speculation about the mechanism involved (see especially Plunkett and Barr 1956, Segal and Nelson 1957, Witschi et al. 1957, Danon and Sachs 1957, Grumbach et al. 1957). It has often been suggested that the defect is genetic (Reifenstein 1947, Sniffen et al. 1951, De la Balze et al. 1952, Sohval and Soffer 1953, Grumbach et al. 1957). Familial transmission through more than one generation has, however, only once been recorded (Reifenstein 1947) and was thought in that family, in which transmission was maternal, to be due to a sex-linked recessive type of inheritance (Reifenstein 1957, cited by Grumbach et al. 1957). Affected sibships have more often been recorded (Nadler et al. 1950, Sohval and Soffer 1953, Bunge and Bradbury 1956, Grumbach et al. 1957). Associated conditions include oligophrenia (Pasqualini et al. 1957, Ferguson-Smith 1958) and dystrophia myotonica (Nadler et al. 1950, Grumbach et al. 1957, Siebenmann 1957). Sibships have been reported with chromatin-positive and chromatin-negative cases (Bunge and Bradbury 1956, Grumbach et al. 1957) and with cases of Klinefelter's syndrome and Turner's syndrome (Bassöe, 1956). There is thus some evidence of the presence of a genetic defect, but little of its nature.

Attention has been chiefly concentrated in recent papers on the more striking chromatin-positive (genetic female) cases. Our own first studies in this field (Ferguson-Smith et al. 1957) had as one of their main results the unequivocal demonstration of a histological difference between the testes of chromatin-positive and chromatin-negative patients* but left us, in spite of this, with a clinical impression that the resemblances between the two varieties of the disease are as important as the differences. The studies reported here suggest that the defect is genetic and that the mechanisms operating in chromatin-positive and chromatin-negative cases are similar in type. They also provide evidence about the nature of the mechanism.

The present study is confined almost entirely to accessible patients from the series (now including less than a third of the chromatin-positive cases identified in this area) of 27 cases, 16 chromatin-negative and 11 chromatin-positive, collected by scrutiny of biopsy specimens and re-study of all available patients with azoöspermia and severe oligospermia who had attended a male subfertility clinic in 1955 and 1956 (Ferguson-Smith et al. 1957).

Case 9 (table I) and case 24 (table II) did not belong to our original series. Case 9 was noticed when he attended a urology clinic with an unrelated complaint. He was married and had previously been investigated for subfertility elsewhere. Case 24 was unmarried and was referred from an endocrine clinic for testicular biopsy.

The fertility-clinic patients are selected in that they are all married men. Compared with other series, ours might

* Unknown to us, Nelson (1956) had in part anticipated these histological findings.

TABLE I—NUMBER OF SIBS AND PARENTS' SIBS OF CHROMATIN-POSITIVE PROPOSITI

Case no.	Age (yr.)	Sibs		Paternal uncles				Paternal aunts				Maternal uncles				Maternal aunts			
		♂	♀	D	U	C	F	D	U	C	F	D	U	C	F	D	U	C	F
1	29	0	2	**9**	**3**	**1**	**4**	0	1	0	1	0	1	0	3	1	0	1	2
2	35	0	1	0	0	0	0	0	0	0	0	0	0	0	3	0	0	1	4
3	29	2	2	0	0	0	1	0	0	0	1	0	0	0	2	0	0	0	1
4	36	1	1	**0**	**2**	**1**	**2**	0	0	0	2	0	1	0	2	0	0	0	2
5	29	1	2	0	0	0	1	0	0	1	1	0	0	1	0	0	0	0	0
6	35	1	1	0	1	0	1	0	0	1	0	0	1	0	1	0	0	0	**3**
7	34	0	1	0	0	1	1	0	0	1	0	0	1	0	0	0	2	0	**0**
8	42	2	3	0	0	0	2	0	0	1	1	0	0	0	1	0	0	0	2
9	39	**3**	0	**1**	**5**	**1**	**0**	1	1	0	2	0	1	0	4	0	1	1	**3**
Total		10	13	10	11	4	12	1	2	4	8	0	5	1	16	1	3	3	17
Proportion of childless to fertile adults (U+C) : F				**15 : 12**				6 : 8				6: 16				6 : 17			
Sex ratio (total males : total females)		10 : 13		**37 : 15**															
Average size of family including propositus or parent		3·6						6·8				22 : 24 · 6·1							

Important families and significant ratios (see text) indicated in bold type.
C, married but childless. D, died young. F, married and fertile. U, adult but unmarried.

TABLE II—NUMBER OF SIBS AND PARENTS' SIBS OF CHROMATIN-NEGATIVE PROPOSITI

Case no.	Age (yr.)	Sibs			Paternal uncles				Paternal aunts				Maternal uncles				Maternal aunts			
		♂	♀	?	D	U	C	F	D	U	C	F	D	U	C	F	D	U	C	F
10	32	2	2	5	2	1	0	3	0	0	0	5	**0**	**1**	**1**	**0**	0	0	0	2
11	29	0	0		0	0	0	3	0	0	1	2	0	0	1	1	0	0	0	1
12	29	0	0		0	1	1	0	0	0	0	2	**1**	**2**	**1**	**0**	0	0	0	1
13	29	5	2		0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	2
14	31	0	2		0	1	0	3	0	1	0	1	0	0	0	3	0	0	2	1
15	31	1	2		0	0	1	2	1	1	0	0	0	0	0	0	0	0	1	2
16	32	4	4		0	0	0	2	0	0	0	1	**0**	**2**	**0**	**0**	0	0	0	3
17	40	3	2		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	37	2	0																	
19	31	1	1		0	0	0	1	0	0	3	0	0	1	0	3	0	0	0	3
20	29	0	1	1	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	1
21	30	2	2		0	1	0	2	0	0	0	0	**0**	**2**	**0**	**0**	0	0	0	3
22	38	2	1		0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0
23	39	0	3		0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1
24	40	0	0		0	0	0	1	0	0	0	2	**0**	**1**	**1**	**2**	1	0	0	0
Total		22	22	6	2	4	2	21	1	2	5	14	1	9	4	12	1	1	3	20
Proportion of childless to fertile adults (U + C) : F						6 : 21				7 : 14				**13 : 12**				4 : 20		
Sex ratio—total males: total females			22:22				29 : 22								26 : 25					
Average size of family including propositus or parent			3·9				4·6								4·6					

Important families and significant ratio (see text) indicated in bold type.
C, married but childless. D, died young. F, married and fertile. U, adult but unmarried.

therefore be expected to contain more superficially normal men and fewer with subnormal intelligence or with major congenital defect. For example, one of our chromatin-positive cases (see figure) is a tall, powerfully built, deep-voiced "male" who shaves daily. Gynæcomastia is absent. Facial and body hair, although somewhat scanty, is well within normal limits. Measurements are moderately eunuchoid (height 1·87 m., span 1·92 m., from crown to pubis 0·89 m., from pubis to sole 0·98 m.), but the main pointer to abnormality revealed by clinical examination is the presence of small firm testes, each about 20 mm. long. The great ease with which cases like this can be overlooked is of considerable importance in connection with our estimate of the absolute frequency of Klinefelter's syndrome, and with our suggestion that its familial incidence must be higher than is generally recognised.

Superficially normal "male" who is chromatin-positive.

Absolute Frequency

A rough estimate of the minimal incidence of Klinefelter's syndrome (of some importance as regards its genetics) can be derived from our figures. Most of the subfertility clinic's patients come from a relatively narrow age-range, the decade of maximal attendance with us being 28–37 years. In this decade we have 4 chromatin-positive and 4 typical chromatin-negative patients with Glasgow addresses. The 1,000,000 inhabitants of Glasgow include 72,000 of either sex of this age. If we have collected all the cases in Glasgow, the frequencies indicated are 1 : 18,000 of each. But not all such persons marry; not all married patients seek advice for their sterility; and not all persons seeking such advice are referred to this clinic. Clearly, even in this decade we cannot have collected all the cases in Glasgow into this one series. We do not think that any random or unrecognised errors in our estimate can counterbalance these factors, and conclude that the true frequency of both chromatin-positive and chromatin-negative varieties of the syndrome can hardly be less than 1 in every 10,000 (reputed) male births.

Family Studies

None of our patients, so far as we know, are related, and it was impossible to examine more than a fraction of the relatives, but important information was obtained by careful questioning of 25 of our patients. These results show one minor discrepancy from their earlier presentation in preliminary form (Stewart et al. 1957), 1 chromatin-negative case having been eliminated because of doubt over the significance of the biopsy finding. (An exact histological definition of chromatin-negative Klinefelter's syndrome has not yet, we believe, been achieved but a more detailed consideration of our present views on this question is to be published elsewhere [Ferguson-Smith et. al. 1958].)

Propositi.—Associated inherited defects were inconspicuous. Some of our patients were clearly of low intelligence, but formal intelligence testing was not done.

Sibs.—One of our chromatin-negative patients (case 18) has a brother, also chromatin-negative, who shaves once a week and is grossly eunuchoid (height 1·70 m., span 1·85 m.) but has testes of normal size. His only other brother is married and has three children. Since the family are refugees from Central Europe, details of the parental generation are unavailable. None of our other patients has reported any significant deviation of the sex ratio of the sibs (tables I and II). The average age is too low for accurate estimates of childlessness, but many are married and fertile.

Parents' sibs.—Among the aunts and uncles of the propositi are most curious anomalies. Essentially they consist in an excess of childless uncles, paternal in the chromatin-positive cases (table I) and maternal in the chromatin-negative cases (table II). In the latter group there is no excess of uncles, but in the families with chromatin-positive propositi there are an excess of paternal uncles and a deficiency of paternal aunts, shown by disturbance of the sex ratio.

In calculating the proportion of childless to fertile adults we have omitted those who died young (though we have included them in calculating the sex ratio). We have, however, included the unmarried (of marriageable age) in estimating childlessness. Failure to marry seems to be as distinct a characteristic of these families as infertility when married; and, if some of these childless uncles are examples of Klinefelter's syndrome (or something closely allied to it), eunuchoidism and lack of sexual drive may well have been an important factor. Two figures in table I require brief comment:

(1) The 10 who "died young" include 9 members of a single family with the remarkable sex ratio of 18 males to 2 females. 4 were killed in a single accident, and 5 died in the 1914–18 war; so the natural suspicion that the high death-rate is due to congenital defect of some kind is unjustified.

(2) There is a high ratio (6:8) of childless to fertile paternal aunts, but this is based on relatively small numbers and is not formally significant, and we have assumed it to be due to chance.

As regards the individual families, the excess of childless uncles is limited to 3 of 9 chromatin-positive and 5 of 15 chromatin-negative cases. The three affected families with chromatin-positive propositi all show an abnormal sex ratio in the parental generation. No abnormal sex ratio can be shown in the propositi's own generation, nor (though this is less important, because many of the sibs are still young) any excess of infertility. The high average size of family in the parental generation in table I has probably helped to make the effect obvious. However, if all the cases were familial, some abnormality of the sex ratio among sibs would have been expected in spite of the smaller families. We must therefore conclude that only some of the cases are familial; the tabulated figures suggest about a third in both varieties of the syndrome, but a much larger series would be necessary to establish this with any exactitude.

Calculation of Significant Differences

Table I.—The proportion of childless to fertile adults for paternal aunts, maternal uncles, and maternal aunts of chromatin-positive propositi are 6 : 8, 6 : 16, and 6 : 17 respectively; but these three groups belong statistically to the same population, and therefore the proportions can be combined (18 : 41). The proportion for paternal uncles (15 : 12) differs from the combined proportion, and the difference is significant ($\chi^2 = 4{\cdot}914$; $p < 0{\cdot}05$). The sex ratio of males to females at birth is 106 : 100; therefore the expected ratio for 52 paternal uncles and aunts is 26·8 : 25·2. The discovered sex ratio (37 : 15) differs from this, and the difference is significant ($\chi^2 = 8{\cdot}081$; $p < 0{\cdot}01$).

Table II.—A similar calculation for relations of chromatin-negative propositi shows a proportion for maternal uncles (13 : 12) different from the combined proportion for the others (17 : 55), and the difference is significant ($\chi^2 = 6{\cdot}898$; $p < 0{\cdot}01$).

Twinning

Our earlier histological work suggested analogies (which still hold in some respects) between the sex-reversed gonad of chromatin-positive Klinefelter's syndrome and the partially sex-reversed ovary of the freemartin in cattle (Lillie 1917). We therefore paid special attention to the incidence of twins in the present families. We know of no chromatin-positive patient with Klinefelter's syndrome who has had a normal male twin; so the direct comparison with the freemartin fails at once. Moreover there are three known cases of human dizygotic twins in which blood-group studies have proved the occurrence of intrauterine circulatory mixing, and each consists of a male and a normal (proved fertile in two cases) female (Dunsford et al. 1953, Booth et al. 1957, Nicholas et al. 1957). However, if our cases came from families with a high incidence of twinning, it might have been worth considering the possibility of death in utero of a male twin which had initiated sex-reversal changes, an unlikely but not wholly indefensible hypothesis. However, our data (table III) show no significant excess of twins among the families of the propositi and lend no support to the hypothesis that these patients may be freemartins.

TABLE III—INCIDENCE OF TWINS IN FAMILIES OF PROPOSITI

	Families of 9 chromatin-positive patients			Families of 15 chromatin-negative patients		
	Total no. of individuals	Pairs of twins	Families with twins	Total no. of individuals	Pairs of twins	Families with twins
Propositi and siblings ..	32	1	1	65	1	1
Nephews and nieces ..	33	0	0	80	2	2
Parents, uncles, and aunts ..	115	4	2	130	0	0
Total	180	5	3	275	3	3

Colour-blindness

Colour-blindness, the commonest readily demonstrable sex-linked recessive character, can be used to distinguish groups of individuals with one X chromosome, in whom it is common, from those with two, in whom it is rare. Polani et al. (1956) applied this reasoning successfully to Turner's syndrome, and Bishop et al. (1956) suggested that the method might be used in Klinefelter's syndrome. We therefore tested colour-vision in most of our patients. Proof of a negative is needed with the chromatin-positive cases, and this will need a very large series; it is hoped, however, that the collected material of Dr. Polani, to which our own cases are being added, will soon reach levels of statistical significance. Colour-blindness has, however, so far been found only in our chromatin-negative cases, and it seems already reasonable to predict that the method will again serve to prove that nuclear sexing has been a reliable index of the number of X chromosomes present (Polani et al. 1957).

Discussion

The present series is unusual in several respects. It was collected in a comparatively short time from a two-year sample of patients attending a male subfertility clinic, a highly specialised field which apparently has not hitherto been systematically explored for this purpose. From this sample, unselected in other ways, we calculated that the incidence of both chromatin-positive and chromatin-negative Klinefelter's syndrome is at least 1 of each in every 10,000 male births. The condition is clearly much more common than had previously been supposed. It follows that many patients with Klinefelter's syndrome go through life undiagnosed; and in fact very few of the present series had been labelled "Klinefelter's syndrome" until after the present investigation had started.

Another very important feature of the present series is the relative normality of outward appearance of many of our patients (see figure). We have previously noted (Ferguson Smith et al. 1957) that several of our patients, including 4 chromatin-positive, had spermatozoa in their seminal fluid when first seen, and it is clear that few of the cases conform to, or could be recognised from, the

classical descriptions of the syndrome (Klinefelter et al. 1942) or its modifications (Heller and Nelson 1945, Howard et al. 1950). Yet the concurrence of testicular histology, hormone assays, and nuclear sexing makes it certain that these cases belong to the same group as the more obvious examples.

With greater awareness, diagnosis becomes easier, and the two clinicians among us have already begun to recognise the condition in patients referred for totally unrelated complaints. The use of buccal smears for nuclear sexing makes diagnosis of the chromatin-positive cases easy and certain, but equally confident diagnosis of chromatin-negative cases requires biopsy, although the condition can be suspected from the clinical appearances and to some extent confirmed by the pattern of excretion of hormones. It will therefore be difficult to establish the true incidence of chromatin-negative cases. In contradistinction to most previous studies our own suggests that chromatin-negative cases are at least as common as the chromatin-positive variety.

Our crucial finding is the excess of childless uncles (tables I and II). A possible attractive explanation is the presence, in the families concerned, of a substantial number of unrecognised cases of Klinefelter's syndrome. The existence of individuals who should have occupied the position of paternal aunts to our chromatin-positive patients but have apparently been sex-reversed into sterile " males " would explain both the high incidence of childlessness and the change in the sex ratio. In the families of our chromatin-negative patients a corresponding number of affected males on the maternal side would produce a similar incidence of childlessness; but, since the sex is not reversed, the sex ratio would not be affected.

There are two difficulties in accepting this:

(1) We have not yet proved that any of our childless uncles have Klinefelter's syndrome, but this we believe to be solely due to accidental circumstances which have made it impossible to examine members of the most important families. (Hearsay evidence of small testicles has been obtained in 1 case. Efforts are being continued, but many of the males concerned are dead or otherwise inaccessible.)

(2) Sibships containing several cases of Klinefelter's syndrome should be common, whereas only a few familial cases have been published. This seems to be a serious objection to the theory, but may only mean (as emphasised above) that the great majority of cases go completely unrecognised.

The somewhat complex genetic implications can only briefly be considered here. We have been very much influenced by a strong clinical impression that chromatin-positive and chromatin-negative cases are variants of the same syndrome. We therefore accepted the evidence of tables I and II as suggesting not only a genetic mechanism but also similar modes of inheritance; it also provides evidence of the nature of this mechanism:

(1) The presence in two generations—presumptive in our cases and established in Reifenstein's (1947)—suggests a dominant character.

(2) The seeming transmission by the parent of sex opposite to the presumptive genetic sex of the patient indicates that the condition is sex-controlled. (A sex-controlled condition is one in which expression of a defect is limited to one or other sex.)

(3) This dominant character seems not to be sex-linked (carried on the unpaired portion of the X chromosome), because some of the chromatin-positive patients with apparently affected paternal uncles had fertile paternal aunts. The defect therefore seems to be autosomal. (The colour-blindness data, which strengthen the view that chromatin-positive patients were genetic females (XX), is further evidence that the sex chromosomes are normal.)

The defect must arise by gene mutation or by chromosomal aberration. Possibly more than one mechanism may operate, but only a chromosomal aberration can readily explain the association with other hereditary conditions and the occurrence of chromatin-positive and chromatin-negative cases in a single sibship. The most hopeful line of explanation invokes the balance theory of sex inheritance (Goldschmidt 1955), which recognises the presence, both in males and females, of masculinising (M) factors outside the X chromosomes and probably in a pair of autosomes. Danon and Sachs (1957) considered that mutation, a qualitative abnormality involving such an M gene, might be causal in chromatin-positive cases, and a more explicit hypothesis of its mode of action in these cases was put forward in an editorial accompanying their paper (*Lancet* 1957).

We prefer to suppose that the defect is quantitative, with duplication of the M locus in one chromosome of chromatin-positive cases and deletion of this same locus in chromatin-negative cases. The chromatin-positive patients would be masculinised females due to effective triplication of the M locus, and the chromatin-negative patients would be feminised males, or at least males of subnormal masculinity, due to deletion of one of the normal two M loci. Such a defect must clearly be transmitted by a carrier whose sex was opposite to the (genetic) sex of the propositus, thus explaining the opposed maternal and paternal transmissions of the two varieties of the disorder.

We do not wish here to do more than to show, on the evidence of our own cases, that a genetic mechanism appears to be common to both chromatin-positive and chromatin-negative varieties of Klinefelter's syndrome, and that chromosomal aberrations resulting respectively in excess and defect of the number of M genes present afford the best explanation yet available. Although translocation (Plunkett and Barr 1956) merits careful consideration, the most probable basis seems to be some form of inversion cross-over.

More detailed consideration of the nature of the chromosomal aberration(s) involved must await further data. It is clear that further work on the families of patients with Klinefelter's syndrome is required. Simple statistics of family size such as we have presented could be readily collected in most cases. Special efforts should be directed to finding unsuspected examples of the syndrome in families in which there seems to be a high incidence of childless uncles. Families with associated congenital traits also deserve especial attention.

We recognise that the evidence we have presented for familial transmission of the syndrome is far from perfect, but we believe we are justified in drawing attention to the possibility, because establishment of a mode of transmission of the defect would greatly clarify our ideas of its fundamental nature.

Summary

Klinefelter's syndrome is probably a good deal commoner than is generally realised, an incidence at least 1 : 10,000 each for chromatin-negative and chromatin-positive varieties being suggested.

The possibility of familial transmission, at least in some cases, is indicated by the presence of an excess of childless males among the parents' sibs, limited to the father's sibs (indicating paternal transmission) in the chromatin-positive cases and to the mother's sibs (indicating maternal transmission) in the chromatin-negative cases.

In addition to the many members of our own departments who have helped us, we have to thank Dr. A. D. T. Govan for hormone estimations, Prof. L. S. Penrose for reading our manuscript, Dr. R. A. Robb for help with the statistics, and Prof. E. J. Wayne for permission to publish one case.

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ACUTE PHARYNGITIS ASSOCIATED WITH ADENOVIRUS TYPE-3 INFECTION

D. MUNRO-ASHMAN
M.B. Lond.
GENERAL PRACTITIONER, BUCKLEBURY, BERKS

P. S. GARDNER
M.B. Lond., Dip. Bact.

C. E. D. TAYLOR
M.A., M.D. Cantab., Dip. Bact.

J. C. MCDONALD
M.D. Lond., D.P.H., D.I.H.
OF THE CENTRAL PUBLIC HEALTH LABORATORY, COLINDALE, LONDON, N.W.9

MOST outbreaks of acute respiratory disease attributed to adenovirus infection have been of pharyngitis associated either with conjunctivitis or with tracheobronchitis and occasionally pneumonia. Pharyngoconjunctival fever, as the former syndrome has been called, seemed at first to be due only to type-3 virus (Bell et al. 1955, Cockburn et al. 1956, Sobel et al. 1956), but there is now evidence that types 4, 7, and 14, and perhaps other types, may cause a similar illness (Forssell et al. 1956, Kendall et al. 1957, van der Veen, personal communication). Most outbreaks of pharyngoconjunctival fever have been in summer, and it has been suggested that swimming-baths may be responsible for spreading infection and perhaps for the conjunctivitis. The second syndrome mentioned—acute pharyngitis with frequent involvement of the lower respiratory tract but without conjunctivitis—has been found almost entirely among military recruits in the winter months (Berge et al. 1955, Hilleman et al. 1955, Andrews and McDonald 1957, van der Veen and Kok 1957) and has been associated with several types of adenovirus, including type 3.

The outbreak here described took place in a boys' residential public school in Berkshire during February and March, 1957, and was apparently due to type-3 adenovirus. Though pharyngitis was the main sign, there was little conjunctivitis and no bronchitis or pneumonia. A rather similar epidemic, associated with type-7 virus, in a school in the North of England during the autumn of 1955, was described by Tyrrell et al. (1956).

The Epidemic

It is difficult to be certain about the date of the first case, because the epidemic was preceded in January by a small outbreak of a febrile illness often accompanied by severe muscle pains. This was thought to be Bornholm disease, but no evidence of Coxsackie virus or of adenovirus infection was found at that time in specimens taken from 10 patients and examined in the laboratory. A few cases of pertussis during the same period further complicated the picture. However, the accompanying figure shows that there was a major epidemic at the end of February and during March.

From Feb. 25 until the end of the term the illnesses seemed clinically homogeneous and different from what had gone before. During this time 134 (34%) of the 395 boys in the school were admitted to the sanatorium or to a dormitory set aside to take the overflow. All the boarding-houses suffered to about the same extent; the only systematic feature apparent in the distribution of cases was that they were more among the young than the old. A possible explanation of this was that older boys slept in cubicles and not in dormitories. Attack-rates by year of birth were as follows: 1938, 8%; 1939, 21%; 1940, 37%; 1941, 31%; 1942, 42%; and 1943, 47%. Only 5 adults were affected—3 of 35 masters and 2 of 10 nurses or house-matrons.

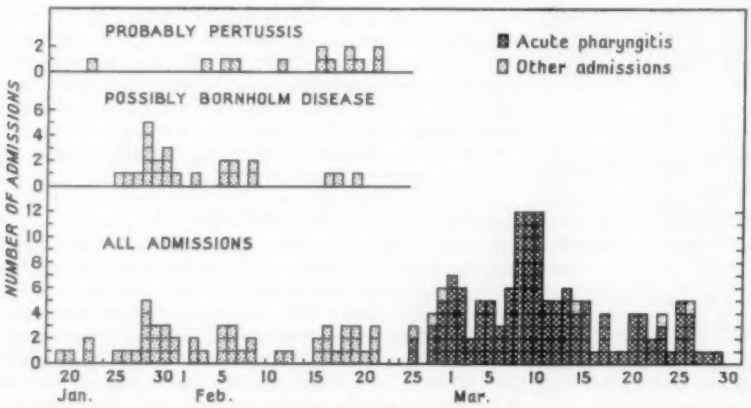
Examination of serial intervals between dates of onset by dormitory gave no indication of the incubation period. In 1 boy it must have been at least six days; he left school alone on March 16 to sit an examination in Oxford and became ill on his way back to school on March 22; virus was isolated from a throat swab taken from him on the same day.

Clinical Features

The onset of the illness was usually sudden, with pyrexia of 101–103°F falling gradually to normal in four to six days. The predominant symptoms were sore throat, headache, and a slight dry cough. Nasal symptoms, usually of obstruction, were present in just under half the patients, and sweating was prominent in about a third. Other and less common complaints were of hoarseness, pain in or behind the eyes, general muscle pains, and dizziness. The fauces were injected, many boys having pin-head vesicles on the soft palate. Apart from 2 cases with definite conjunctivitis and 1 with obvious enlargement of the cervical lymph-glands, there was little or no evidence of lymphadenopathy or of conjunctivitis. Recovery was usually rapid; the only complications were 2 cases of otitis media, which were treated with penicillin and settled rapidly. No symptoms or signs of bronchitis or pneumonia were found. Boys who remained febrile for more than four days were treated with penicillin, and this usually coincided with a fall in temperature.

Laboratory Methods

Attempts to isolate the virus were made in a similar manner to that described by Kendall et al. (1957). HeLa-cell cultures were grown



Daily admissions to school sanatorium.

in a medium containing 20% human serum; before inoculation the serum was removed from the cell culture by washing and replaced by a maintenance medium containing 2% rabbit serum. 0·2 ml. of Hanks' salts solution, into which throat or eye swabs had been broken, were inoculated into each of two tubes of HeLa-cell cultures. The cultures were kept for fourteen days and, if negative at the end of this period, were given a blind passage in two more tubes of HeLa-cell culture.

When degeneration suspected of being due to an adenovirus occurred, the culture tubes were frozen and thawed, and the fluids were tested by the complement-fixation test for the presence of adenovirus using a known positive serum. Viruses found in this way were typed in HeLa-cell cultures containing 0·5 ml. of maintenance medium to which was added 0·1 ml. of type-specific serum followed by 0·1 ml. of suspected virus under test. The dose of virus was adjusted to give complete degeneration in two to three days. The sera used were those of types 2, 3, 4, and 7, and were supplied by Dr. B. E. Andrews. They had been prepared in rabbits which had received a series of intravenous injections of supernatant fluids from HeLa cultures infected with adenovirus prototype strains.

The complement-fixation test was performed in the cups of plastic hæmagglutination plates (World Health Organisation 1953). Serum, complement ($2^1/_4$ M.H.D.), and antigen were mixed in 0·1-ml. volumes and incubated at 37°C for one and a half hours; 0·2 ml. of a 1% suspension of sensitised sheep red blood-cells was then added. After thirty minutes at 37°C the plates were stored overnight at 4°C, and the results were read next morning. Titres recorded were the highest serum dilutions showing about 75% or more of the red cells unlysed. The antigen was used at the optimal dilution and was prepared from cultures of HeLa cells infected with RI-67 virus (adenovirus type 4). This was supplied by the Standards Laboratory, Colindale.

Laboratory Findings

Samples of blood were taken from 11 patients in the acute and convalescent stages. Throat swabs for virus-isolation tests were taken from 10 of these and from 4 others. 8 of the 11 pairs of sera gave a fourfold or greater rise in adenovirus complement-fixing antibody. The 3 negative results were in boys from whom the convalescent-blood specimen was not taken until eight weeks after the onset of illness. Complement-fixation tests for influenza A, B, and C, psittacosis, Sendai virus, and *Rickettsia burneti* were all negative and so was the *Streptococcus M.G.* agglutination test for atypical pneumonia.

Adenovirus strains were isolated from 8 of 14 throat swabs tested. Serological evidence of adenovirus infection was found in 3 of the failures; the remaining 3 were in boys from whom swabs were not taken till the fifth or sixth day of illness. All 8 strains were found to belong to type 3. 13 of the 14 throat swabs were tested in fertile hens' eggs for the influenza viruses and found negative.

Nose and throat swabs from 42 cases at various stages of the outbreak were examined by Dr. N. Wood, of the Public Health Laboratory, Reading, who reported a heavy growth of hæmolytic streptococci in 1, a moderate growth in 2, and a scanty growth in 3. 1 of the boys with a moderate growth of hæmolitic streptococci developed a scarlatiniform rash, but he also had a fourfold rise in adenovirus complement-fixing antibody.

Summary and Conclusion

An epidemic is described of acute pharyngitis in a boys' public school in Berkshire during February and March, 1957.

A third of the 395 boys were admitted to the school sanatorium, the attack-rate varying inversely with age.

The symptoms and signs were those of acute pharyngitis; only 2 patients had definite conjunctivitis, and none had bronchitis or pneumonia.

Laboratory tests on a representative sample of patients indicated that the outbreak was caused by infection with adenovirus type 3.

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TREATMENT OF INGROWING TOENAILS

ROGER BREARLEY
M.B. Lpool, F.R.C.S.
SENIOR SURGICAL REGISTRAR, WHISTON HOSPITAL, PRESCOT, LANCS

ONLY thirty-nine papers wholly on ingrowing toenail seem to have been published in the past fifteen years, three of them in British periodicals (Nuttall 1942, Zadik 1950, Kemp 1955). This comparative silence is not due to universal agreement on the subject; five textbooks of surgery chosen at random offer eleven different methods of treatment. Usually these methods are not based on explicit pathology; but, when they are so based, usually the statement is made simply that pressure from tight shoes and socks, combined with cutting the nail short, or trimming away its corners, leads to pressure ulceration at the lateral edge of the nail, followed by suppuration and granulation.

A fuller account is given (in an article not exclusively concerned with ingrowing toenail) by Lake (1951), who describes two varieties:

(1) *Juvenile type.*—Commonest in the age-group 14–18, especially in males. The nail is flat from side to side, the lateral fold being large and overhanging. At first only discomfort is felt. Ulceration, suppuration, and granulation follow later. Lake doubts if tight shoes are a cause.

(2) *Adult type.*—Usually after middle age. The transverse curvature of the nail is much increased, with the result that the edge digs into the toe. It causes discomfort and callosity but seldom suppurates.

Fig. 1—Transverse section of terminal phalanx of hallux with ingrowing toenail of juvenile type.

Fig. 2—Transverse section of terminal phalanx of hallux with ingrowing toenail of adult type.

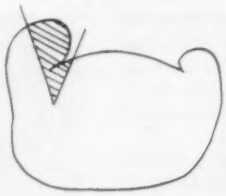


Fig. 3—Watson Cheyne's operation: shaded area is excised.

Pathology

My personal observation confirms Lake's findings. Although the age correlation is not invariable, the morphological distinction is real and important, and the terms " juvenile " and " adult " are convenient.

In the juvenile type (fig. 1) the nail may be normally arched, flat, or even slightly concave. The edges are directed outwards, away from the bone. Ingrowth may occur at the medial or lateral side or both. The toe is often moist, with white macerated skin. The affected nail-fold is greatly enlarged, burying the lateral margin of the nail and partly concealing its dorsal aspect. The pulp of the terminal phalanx seems to be abnormally flaccid and yielding, and can be rolled dorsally round the side of the toe, increasing both the width of the phalanx and the depth of the nail-fold. To some extent this displacement of the pulp is permanent, but it is momentarily increased with each step as the toe is pressed down. From the dorsal aspect the widening of the terminal phalanx is strikingly obvious by comparison with the proximal phalanx (figs. 4 and 12). Because of its increased width, the affected phalanx receives an impression on its lateral aspect from the second toe (fig. 5), and the sideways and dorsal displacement of the pulp leads to flattening of the plantar surface. This throws the weight-bearing point proximally, and a callosity may develop just distal to the interphalangeal skin-crease.

Ætiology

Trimming away the corners or lateral borders of the nail is undoubtedly harmful and may precipitate ulceration and sepsis. The role of tight shoes is more doubtful. They always offer an easy target for abuse, but it is noteworthy that the affected part is wider than it should be, not narrower, and that females, who are more prone to wear narrow shoes, are less commonly affected than males. Lake concurs in disbelieving that shoes are responsible.

On the other hand, many of the patients work in gumboots, or at occupations in which the feet are constantly wet, and some seem to have primary hyperhydrosis. The wet macerated skin, which has already been mentioned as a common finding, contributes to the general softening, which allows such ready displacement of the pulp; it also hastens the onset of pressure ulceration at the edge of the nail. Laxity of the pulp seems to be the crucial factor,

Fig. 4—Toe before operation.

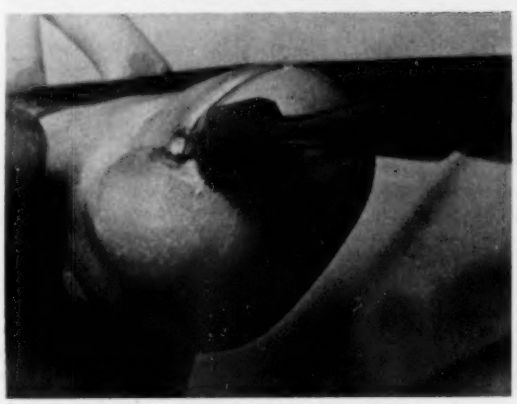


Fig. 5—Undermining with blunt dissector.

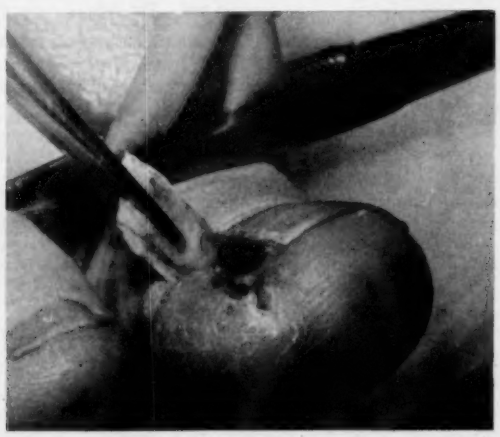


Fig. 6—Avulsion of undermined strip.

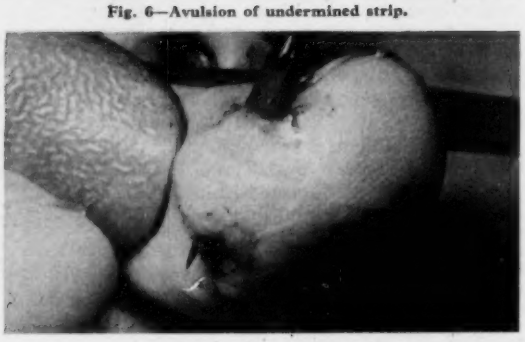


Fig. 7—Introduction of scalpel.

however. Its cause is not evident, though its effects are clear enough. The bony phalanx and nail are firmly bound together as a rigid unit which, when the toe bears weight, the flexors press down into the soft pulp, which streams up round the side of the bone pushing against the edges of the nail and swelling the nail-fold.

The adult type (fig. 2) is a much less common cause of symptoms. The specific feature is a tendency of the edges of the nail to turn in towards the phalanx. Softening of the pulp is not found. In the absence of diabetes and of arterial occlusion it does not usually cause ulceration.

Fig. 8—Formation of flap.

Treatment

The remedies suggested in standard textbooks include the following:

(1) Cutting the nail square, packing cotton-wool beneath the corners, and wearing wide shoes.
(2) Thinning the centre of the nail by scraping.
(3) Cutting away a V at the centre of the free edge of the nail.
(4) Avulsion of the nail with or without curetting away granulations.
(5) Filleting the nail-bed off the dorsum of the phalanx.
(6) The same, with skin-grafting of the raw area.
(7) Zadik's operation (filleting off the proximal portion of the nail-bed, and closure by dorsal skin-flap).
(8) Watson-Cheyne's operation (fig. 3).
(9) Willett's operation (see below).
(10) Amputation of half the terminal phalanx, including the nail-bed, and primary closure by plantar flap.
(11) Amputation of the terminal phalanx.

In the absence of ulceration, suppuration, and granulation conservative measures (1), (2), and (3) usually succeed, especially in lesions of the adult type. On the infrequent occasions when infected adult-type lesions (not due to diabetes or to ischæmia) do not yield to conservative methods, amputation of half the phalanx, with ablation of the nail-bed, is satisfactory. However, most patients requiring operation have infected juvenile-type lesions.

Fig. 9—Toe after amputation of flap.

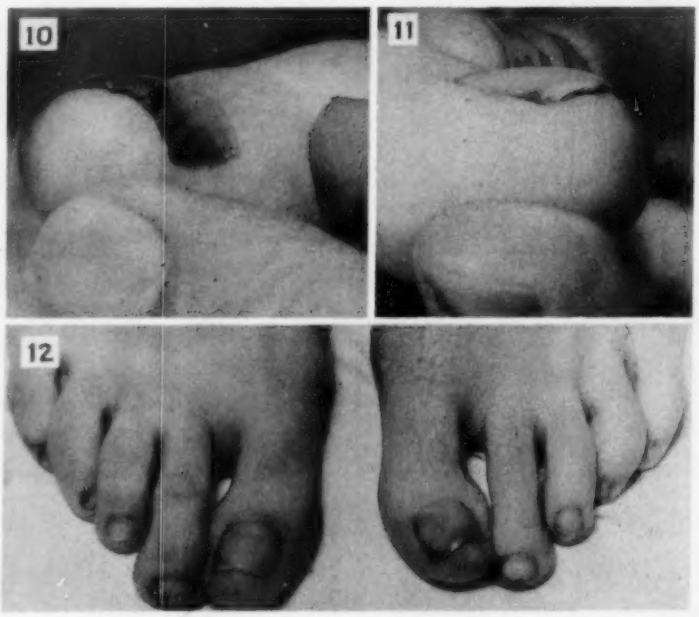
For these the conservative measures (1), (2), and (3) are insufficient. Avulsion (4) is followed by recurrence when the nail regenerates, and (5), (6), and (7) are often marred by painful recurrent spicules of nail and produce deformity. Watson-Cheyne's operation has both these faults and also leads to recurrences indistinguishable from the original condition. The amputations (10) and (11) are mutilating, and occasionally healing is delayed by osteomyelitis or by sinuses.

I describe here a new method, similar in principle to Willett's operation, which is suitable for all juvenile-type cases requiring surgery. Willett's operation is described as follows (Burrows 1955):

"This aims at the production of a flat scar along that side of the nail which tends to grow in. A tenotome is passed in at the side of the base of the nail, deep to the skin and undercutting it to a width of half an inch. The tenotome is then worked forwards to beyond the tip of the nail, thus raising a flap of skin half an inch wide along the whole nail margin; this flap is cut off at its base and the raw area allowed to heal by granulation."

Present Operation (figs. 4–9)

The toe is cleansed. Digital-nerve block or general anæsthesia is induced. A McDonald's blunt dissector is



Figs. 10-12—Two years after operation.

passed beneath the nail at the affected side, and the strip thus undermined is cut free and avulsed. A scalpel is introduced at the proximal end of the groove between nail-fold and nail-bed so as to bisect the angle between the two. It is pushed through to emerge from the lateral margin of the toe. Its point of emergence should be well down towards the plantar surface, so that the points of entrance and exit are at least half an inch apart. The knife is then advanced distally, cutting a flap consisting of the nail-fold and a substantial strip from the side of the toe (fig. 8). The knife is then turned round, the flap is tapered off and amputated at its base, bevelling off the bare area proximally (fig. 9). The toe is wrapped tightly in a soft-paraffin gauze bandage, which is left for a fortnight, unless there are signs of gross sepsis. The tourniquet shown in the photographs is a great help though not essential.

The following points require special emphasis:

(1) This operation is unsuitable for the adult type of ingrowing toenail.

(2) The knife enters the angle between nail-bed and nail-fold. The nail-bed is not cut in any way.

(3) It is essential to remove enough soft tissue because the mobile pulp is always ready to roll round the phalanx and create a new nail-fold. Any excision less than that illustrated is likely to fail.

Results

I have done this operation regularly for the past seven years. Properly carried out in appropriate cases, it is always successful. It produces no deformity of toe or nail, no discomfort or loss of function, and no recurrence. There are no complications such as wound infection, osteomyelitis, and recurrent nail spicules. The period of disability is reduced to a minimum because the operation can be done on outpatients on their first visit. Suppuration is no contraindication; indeed the operation is a most effective way of terminating sepsis. After the bandages have been changed on the fourteenth day, normal walking is possible and the patient can return to sedentary or light work.

Figs. 10–12 show the result two years after operation. The toes are the same ones illustrated in figs. 5–9. Although the patient still cuts the corners of the nails rather short, there is now no tendency to ingrowth, because the skin of the new nail-fold is almost level with the nail-bed.

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". . . With the evolution of man, characterised as it was by delay in development, great prolongation of childhood and resultant consolidation of the family, this pattern of altruistic behaviour must have acquired enormously enhanced importance. The size of the unit within which what may now be called ethical conduct prevailed grew larger, from the family to the clan; but between clans the sub-human competition on lines of natural selection persisted. The same was true when the welfare unit became the tribe, and eventually the nation, but the relations between nations show only too clearly that there is still a step for man's moral evolution to take in enlarging the welfare unit to encompass the whole of humanity. Man's moral evolution is still incomplete."—Sir GAVIN DE BEER, *The Listener*, July 3, 1958, p. 12.

ULCERATIVE COLITIS
A TEST OF PSYCHOSOMATIC HYPOTHESES

M. SIM
M.D. Edin., D.P.M.
CONSULTANT PSYCHIATRIST, UNITED BIRMINGHAM HOSPITALS

B. N. BROOKE
M.D. Birm., M.Chir. Cantab., F.R.C.S.
READER IN SURGERY, UNIVERSITY OF BIRMINGHAM

ULCERATIVE colitis has been claimed to be a member of the psychosomatic group of diseases. According to Halliday (1943) a psychosomatic affection is "a bodily disorder whose nature can be appreciated only when emotional disturbances (i.e., psychological happenings) are investigated in addition to physical disturbances (i.e., somatic happenings)". Apparently some workers regard the case as proven.

Sullivan and Chandler (1932) reported a series which they describe as of psychogenic origin, and Sullivan (1940) elaborated these findings with a paper on Psychogenic Factors in Ulcerative Colitis. Groen (1947) discussed not only the psychogenesis of the disease but also the use of psychotherapy in its treatment, and this theme has been supported by Daniels (1942), Lindemann (1945), Karush and Daniels (1953) and Craddock (1953). In this country Wittkower (1938) described personality studies in 48 unselected cases and found evidence that "ulcerative colitis is a disease of the mentally ill or maladjusted. Almost all the patients showed character disorders, obvious neuroses, or psychoses." With this view Paulley (1956) agrees.

Several hypotheses have been advanced to explain the psychosomatic nature of the condition, and these are well reviewed by Engel (1955), who also illustrates (Engel 1954a, 1954b) the inadequacy of those hypotheses which depend on functional diarrhœa being a preliminary feature. In his own series (Engel 1954b) of 32 patients 22 presented originally with bleeding, and diarrhœa, when it did occur, was usually secondary. On the other hand, support for the "ejection-riddance" theories has come from Grace et al. (1951) who, from their studies of 4 patients with fistulæ (2 with ulcerative colitis), conclude that "the colon of man is likely to participate in his reactions to threatening events in his life situation, including those threats which arise out of problems of interpersonal adjustment. Changes involving colonic hyperfunctioning at first altogether functional and transitory may when unduly sustained result in structural change and disease."

Though agreeing that personality changes are seen in patients with ulcerative colitis, many do not regard these changes as primary. They adopt a "common-sense" view that a person with frequent diarrhœa and bleeding per rectum may well show secondary personality changes; if this were so it would prove a most powerful argument against the psychosomatic theorists. Two of the more attractive hypotheses—those of Alexander (1952) and Grace et al. (1951)—largely depend on diarrhœa being a reaction to frustration; and, since this symptom has been shown by Engel (1954b) to be the less common presenting feature of the disease, there is good reason for further inquiry into a larger series.

Method

A retrospective inquiry into the incidence and order of appearance of each of six main symptoms was undertaken by means of a questionnaire, which was circulated to all 164 members of the Midlands division of the Ileostomy Association. 142 replied, and we attribute

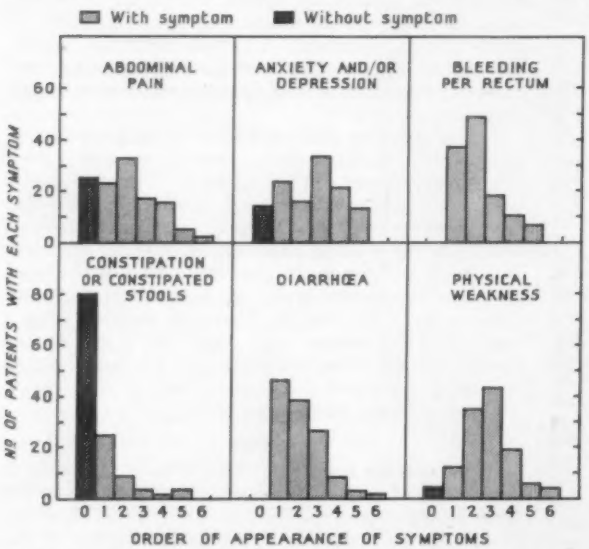
INCIDENCE OF EACH SYMPTOM IN ITS ORDER OF APPEARANCE; LAST COLUMN SHOWS NUMBER OF PATIENTS WHO DID NOT HAVE THE SYMPTOM

Symptoms	Order of appearance						0
	I	II	III	IV	V	VI	
Abdominal pain	23	33	17	16	5	2	25
Anxiety and or depression	23	16	33	21	13	—	14
Bleeding per rectum	37	48	18	10	6	—	—
Constipation or constipated stools	24	9	3	1	3	—	80
Diarrhœa	47	39	27	7	2	1	—
Physical weakness	5	12	35	43	19	5	4
Total	159	157	133	98	48	8	—

this high return to the fact that the form, though designed by ourselves, had been approved by the secretary of the association and sent out to the members by their officers with an explanatory letter.

There are disadvantages in this method; for retrospective surveys are less satisfactory than those planned in advance, and in this particular investigation reliance has to be placed on the memory of patients for symptoms which in about a third of the series had begun five to ten years before. We did consider the perusal of case-histories, but soon realised that, no matter how good these may be, a great difference exists between information obtained by various doctors and a standardised series of questions designed to produce answers in numbers. We chose the questionnaire, not only because of the greater ease in handling the data derived, but because we wanted to test the method itself. The active cooperation of a patient in a therapeutic trial has already been reported by Hogben and Sim (1953), and an Ileostomy Association with a membership of 164 consisting mainly of patients whose diagnosis had been confirmed at laparotomy appeared to us a most suitable medium for this type of investigation.

Of the 142 forms returned, 1 was unsigned. Confirmation of the diagnosis was sought from the surgeons concerned in all cases and was obtained in all but 3; a further 6 had not had ulcerative colitis. Of the 132 who had, 12 returned forms completed in an equivocal manner, and though we had access to most of the information from other sources, we wanted to confine the investigation to data derived from the questionnaire; these were therefore excluded from the study. The replies from 120 patients form the basis of this report and are recorded in the accompanying figure.



Order of appearance of 6 symptoms in 120 patients with ulcerative colitis.

Analysis of Data

Diarrhœa as a presenting symptom is only slightly more common than bleeding (47:37, see table), and therefore the "ejection-riddance" theory finds only very modest support. On the other hand, bleeding presents initially more commonly than most psychosomatic theorists would have us believe; perhaps therefore an alternative hypothesis is needed. Engel (1955) has elaborated one; but, since it depends on the fact that bleeding is the prime feature in the majority of cases, it cannot be considered adequate for the majority of the present series. He does, however, stress that with a careful personal analysis of data (Engel 1954b) more patients admit to bleeding as a first symptom than to diarrhœa, and it may be that the questionnaire did not supply this information accurately. This is a valid argument; but the value of the present method cannot be adequately tested by argument, but only by a carefully controlled prospective inquiry, which we propose to do.

Anxiety and depression are traditionally regarded as important precipitating factors in the illness, yet they provide the first symptoms in only 23; these conditions are so common in the general population that this may be a chance finding. On the other hand it is quite clear that affective disturbances are more frequent as third and fourth symptoms, lending some support to the "common-sense" view that the mental changes follow the physical changes.

Constipation appeared as a presenting symptom in Engel's series in 14 of his 32 patients. This is very different from the proportion in our series (24 out of 120) which seems to represent the subgroup whose disease started as proctitis or procto-sigmoiditis. A more striking feature regarding this symptom is the large number (80) who have not listed it at all.

Summary and Conclusion

A method of inquiry into the presenting symptoms of ulcerative colitis is described, making use of an association of patients known as the Ileostomy Association.

Diarrhœa as an initial symptom is only slightly more common than bleeding. There is little evidence therefore to support existing psychosomatic hypotheses of the origin of the disease.

Anxiety and depression are commoner after than before diarrhœa and bleeding.

This inquiry could not have been made without the fullest cooperation of the Midland Ileostomy Association, and we should like to record our sincerest thanks to the members, and to all those surgeons who kindly answered our inquiry regarding diagnosis of their patients.

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Preliminary Communications

MULTIPLICATION OF RAT-LEPROSY BACILLI IN CULTURES OF RAT FIBROBLASTS

FOR many years experimental rat leprosy has been studied as a model of the human disease. Both are chronic infections caused by mycobacteria in which the bacilli exist as obligate intracellular parasites of mononuclear cells. Until recently neither causative organism has been cultured. Because of the intracellular existence of the bacilli in vivo our attempts to grow rat-leprosy bacilli (*Mycobacterium lepræmurium*) have been made using tissue cultures.

Rees and Wong [1] have recently reported from these laboratories that significant though limited multiplication of *Myco. lepræmurium* can occur in cultures of spleen tissue obtained from previously infected animals. Substantially similar results in spleen cells have been reported by Wallace and his colleagues.[2] Suggestive evidence of multiplication has also been obtained by Hawking [3] using rat monocytes. The successful demonstration, for the first time, of unequivocal multiplication of *Myco. lepræmurium* in tissue culture has been greatly facilitated by the development and use of precise methods for determining the total number of bacilli present in the cell cultures before and after cultivation.[1,2] Previous methods of detecting multiplication, which have depended on the distribution of bacilli in tissue cells, are open to serious error because of the redistribution of bacilli that inevitably occurs in a changing and often diminishing cell population.

Undoubtedly primary cultures of explanted tissue from previously infected animals offer the greatest chance of success, because the bacilli remain undisturbed in the specific host cells. On the other hand such cultures cannot be maintained in a healthy state for the long-term studies required to obtain continuous multiplication of a slowly growing organism like *Myco. lepræmurium* (mean generation time 13 days [4,5]). Such studies require the use of an established line of cells that can be infected with bacilli in vitro. We first tried Earle's L strain of mouse fibroblasts; and, although these cells can be successfully parasitised by *Myco. lepræmurium* in vitro, no multiplication of bacilli was observed in cultures maintained for 46 days. Wallace et al.[2] found the same with L-strain cell cultures, but when the metabolism of these cells was modified by the addition of high concentrations of hydrocortisone limited multiplication of bacilli resulted. It has been our experience that the concentration of hydrocortisone used severely damages the cells, and that the conditions are therefore unsuitable for obtaining continuous multiplication of bacilli.

We have now successfully initiated multiplication of *Myco. lepræmurium* in a strain of rat fibroblast cells without hydrocortisone.

METHODS

Partially purified suspensions of *Myco. lepræmurium* in 5% albumin in saline, or in 5% albumin and 5% yeast supplement in phosphate buffer, were freshly prepared for each experiment from the livers of mice infected intravenously 8–12 weeks previously. The suspensions were adjusted to contain approximately 5×10^{10} bacilli per ml. All procedures were carried out in the cold (2–4°C).

Cultures of the 14pf strain of rat fibroblasts [6,7] were maintained in medium containing 50% human cord serum, HCS_{50}, and 50% Hanks' balanced salt solution, BSS_{50}, or HCS_{30} BSS_{70}. For each experiment cultures of cells were grown for 7–10 days in 'Pyrex' feeding-bottles, in medium containing only 25 units penicillin per ml. and no streptomycin. The medium was withdrawn and the cells carefully washed with an excess of BSS to remove free serum. The cells were then infected by adding to each bottle approximately 10^9 freshly prepared bacilli suspended in 0·0125% albumin in BSS and incubating at 37°C for 24 hours.

Under these conditions the cells remained healthy and readily ingested bacilli which were not directly exposed to the possible toxic effect of serum.[8] On an average approximately 90% of the cells were infected with bacilli as follows: 1–2 bacilli, 15%; 3–5 bacilli, 22%; 6–10 bacilli, 21%; and over 10 bacilli, 31%.

The infected cultures were trypsinised and the cells thoroughly washed in BSS to remove the extracellular bacilli. The cells, after centrifuging, were resuspended in medium (usually HCS_{50} BSS_{50} and 25 units penicillin), carefully maintained in suspension by agitation and rapidly distributed in 1 ml. samples containing approximately 10^5 cells, into pyrex culture tubes. In most of the experiments the tubes were divided into two groups: (a) no addition of antileprous drugs, and (b) addition of 100 γ streptomycin and 0·1 γ isoniazid—a combination expected from chemotherapeutic observations of rat leprosy [9,10] to inhibit growth of organisms in vitro, and so serve as an essential control. Before incubating the cultures at 34 or 37°C, three tubes were set aside for counting the total number of bacilli per tube. The medium was changed every 11 days and retained for counting. Any serious fall in pH or deterioration in the quality of the cells was rectified by the addition of drop quantities of 1·4% sodium bicarbonate or chick-embryo extract, respectively. Three tubes were set aside from each group for counting bacilli on day 13, 26, and 39.

To count accurately the total number of bacilli present in each culture it was first necessary to release completely the bacilli from the cells and so obtain a well-dispersed suspension of organisms. This was achieved in a single operation by exposing the culture tubes to ultrasonic vibration for 15 sec. (Mullard ultrasonic generator type E 7562, frequency 340 Kc per sec.; power 200 watts), a procedure that has been shown to disrupt the cells completely without damage to the intracellular bacilli.[11] Using a modified Breed technique,[12] smears were prepared from a known volume of the disrupted cell cultures, spread over a standard area on a microscope slide and stained by a modified Ziehl-Neelsen method. A count was made of acid-fast bacilli present in equivalent standard samples from each culture. Successive fluid changes from each culture were pooled and counted after similar treatment.

RESULTS

The results of the counts obtained from 9 experiments are shown in the table.

MEAN NUMBER OF ACID-FAST BACILLI COUNTED IN STANDARD SAMPLES FROM CULTURES

Experiment	Group	No. of bacilli				Maximum increase (ratio)
		Day				
		0	13	26	39	
159	A	30·0	66·5	62·0	—	2·2
	B + 0·1 mg. HC per ml.		61·5	62·5	—	2·1
162	A	30·7	60·5	58·0	65·0	2·2
	B + 0·1 mg. HC per ml.		42·0	45·0	42·0	1·4
164	A	48·3	51·0	55·5	47·0	1·2
	B + 0·05 mg. HC per ml.		43·5	53·5	50·0	1·0
167	A	5·8	11·0	19·8	30·5	5·3
	B + 0·05 mg. HC per ml.		9·0	23·5	31·5	5·5
170	A	55·0	100·0	98·0	108·0	2·0
	B + 100 γ SM + 0·1 γ INH per ml.		62·5	54·0	58·0	1·1
172	A	12·3	29·5	32·0	53·5	4·4
	B + 100 γ SM + 0·1 γ INH per ml.		19·5	15·5	13·0	1·6
179	A	32·0	62·6	59·6	—	2·0
	B + 100 γ SM + 0·1 γ INH per ml.		30·1	34·5	—	1·1
181	A	9·8	21·6	24·4	—	2·5
	B + 100 γ SM + 0·1 γ INH per ml.		14·5	12·8	—	1·5
183	A	10·5	18·5	29·3	32·8	3·1
	B + 100 γ SM + 0·1 γ INH per ml.		14·3	13·0	11·6	1·4

HC = hydrocortisone (free alcohol). SM = streptomycin. INH = isoniazid.

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Each mean count of acid-fast bacilli was obtained from a pool of three cultures, from which 2 or 4 spreads were made and each counted in duplicate. In 8 out of 9 experiments the results show a significant increase in the number of bacilli present after incubation in the cultures without streptomycin and isoniazid. There was no significant increase in the number of bacilli in cultures containing high concentrations of the drugs. In 4 experiments a group of cultures containing hydrocortisone was included because of the report [2] that *Myco. lepræmurium* only multiplied within L-strain cells in the presence of the hormone. From our results it can be seen that hydrocortisone is not essential for the multiplication of bacilli in 14pf cells. In general the initial rate of multiplication corresponds closely to that obtained in vivo in the mouse. In some experiments multiplication was almost entirely limited to the first 13 days of incubation, whereas in 3 experiments there was a more continuous increase in the number of bacilli recovered from cultures maintained for 39 days. In these experiments the bacterial populations increased approximately 5·5, 4·4, and 3·1 fold, representing significantly greater multiplication than has been obtained in spleen cultures or L-strain cells plus hydrocortisone.

Although these results are encouraging, the multiplication obtained is either limited to the initial 13-day period of incubation, or, where it has been more continuous, the rate of multiplication has diminished. This could be due to a deterioration in the quality of the cells, since the conditions (adopted primarily for accurate enumeration of bacilli) are not those most suited for providing good cell cultures. On the other hand the cell type used for growing rat-leprosy bacilli is important because, using identical methods of assessment, multiplication did not occur in mouse monocytes,[1] in L-strain cells (without hydrocortisone), or in monkey-kidney cells.[12] Initiation of multiplication of rat-leprosy bacilli in an established and unmodified line of tissue cells offers therefore, for the first time, a reasonable system in which to study the conditions required for continuous multiplication.

We wish to record our thanks to Dr. G. O. Gey for supplying the 14pf cultures and we gratefully acknowledge the technical assistance of Mr. C. V. Gibbs and Miss M. Collins.

ELIZABETH W. GARBUTT
B.A. Queen's Univ., Ontario
R. J. W. REES
M.B., B.SC. Lond.
YVONNE M. BARR
B.A. Dubl.

National Institute for Medical Research, Mill Hill, London, N.W.7

RESPONSE OF THE INFECTED URINARY TRACT TO BACTERIAL PYROGEN

THE difficulty of establishing the diagnosis of chronic pyelonephritis is well known. An attempt has therefore been made to diagnose renal infection by a new and very simple method. It seemed possible that the infected kidney might be in some way sensitive to parenterally administered bacterial products and that evidence of such sensitivity might be found in the urine.

Changes in the excretion-rate of white and non-squamous epithelial cells in the urine after the intravenous injection of a bacterial pyrogen in 6 normal subjects were therefore compared with those in 10 patients in whom the diagnosis of chronic renal infection was regarded as established beyond reasonable doubt.

The controls were 6 normal healthy males who gave no history of urinary tract infection at any time. The urine of all was free of protein and showed a normal excretion-rate of white and non-squamous epithelial cells.

In the 10 patients, the diagnosis of renal infection was made either on histological evidence obtained from renal biopsy, nephrectomy, or necropsy, or on evidence afforded by a combination of the history, or the presence of nitrogen retention in the absence of any other discoverable cause, with the radiological demonstration of nephrolithiasis, deformities of the pelvi-calycine system, or gross deformities of the renal outlines shown by presacral pneumography. Some patients, in addition, had infected urines and nearly all had abnormal cell-excretion rates when first seen.

METHODS

The rate of urinary cellular excretion was determined by the method of Houghton and Pears.[1] Three specimens of urine were collected at hourly intervals before the intravenous injection of 0·007 γ per kg. body-weight of 'Pyrexal' (Wander), a purified lipopolysaccharide derived from *Salmonella abortus equi*. Four specimens of urine were collected at thirty-minute intervals, starting from the time of collection of the last control specimen. The rate of excretion of white and non-squamous epithelial cells was determined on each of these seven specimens. The deposit obtained from 10 ml. of each specimen was stained by Gram's method to demonstrate organisms. From all female patients the urine was collected through an indwelling urethral catheter.

Clearances of inulin and *p*-aminohippuric atid were determined using a constant-infusion technique. Inulin was determined by a modification [3] of Harrison's method [3] and para-aminohippuric acid by the method of Smith et al.[4]

Temperatures were taken in the mouth by clinical thermometer.

RESULTS

In each of the patients and the controls, the difference between the means of the cellular excretion-rates in the three preinjection periods and the first two postinjection periods were calculated. From these differences for each individual, the mean differences for each group were derived and expressed as a percentage of the mean preinjection value for that group. The result for the controls was $-10{\cdot}2\%$; for the patients it was $+186{\cdot}2\%$. The probability of obtaining such a result fortuitously is less than one in a hundred but more than one in a thousand ($0{\cdot}01 > P > 0{\cdot}001$).

There appears to be no correlation between the urine flow and the rate of cellular excretion. In two patients, inulin and *p*-aminohippuric clearances showed that the excretion-rate of cells in the urine increases without any change occurring in the glomerular filtration-rate or the effective renal plasma flow. In all patients, the rise in cellular excretion occurred within thirty minutes, and thus a considerable time before the onset of rigor or fever: in some, the excretion-rate fell as the temperature rose. Cortisone and aspirin appear to modify profoundly the expected changes in the urinary excretion of cells in all the cases so far studied from this point of view. In some patients, bacteria appeared in the urine after the injection of pyrogen when they had been absent before it: in other cases, where bacteria were already present, their number increased greatly after the injection.

A case of acute focal nephritis, proven by renal biopsy, a case of the nephrotic syndrome, and a case of the malignant phase of essential hypertension, all with initially abnormal urinary cell excretion rates, failed to show any change in their rates after the injection of pyrogen. All developed a fever.

Work is continuing in an attempt to elucidate the mechanism of this response of the infected kidney to a substance of bacterial origin injected intravenously, and

13. Wong, P. C. PH.D. thesis, London University, 1957.

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to demonstrate conclusively whether or not it is in fact specific for cases of renal infection. At present, it seems permissible to suggest that the phenomenon is one of hypersensitivity of a site of infection to parenterally administered, heterologous bacterial products, and that it thus bears obvious resemblances to that described by Sanarelli [5] and by Shwartzman.[6]

Department of the Regius Professor of Medicine, The Radcliffe Infirmary, Oxford
M. A. PEARS M.D. Lond., M.R.C.P.

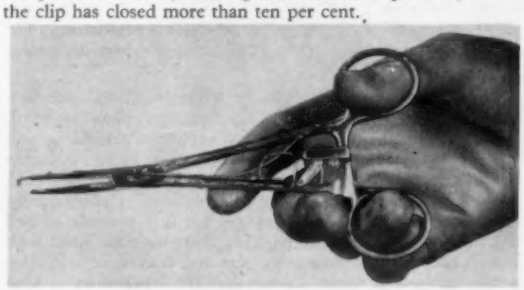
St. Mary's Hospital, London, W.2
B. J. HOUGHTON M.B. Lond.

5. Sanarelli, G. *Ann. Inst. Pasteur*, 1924, **38**, 11.
6. Shwartzman, G. *J. exp. Med.* 1928, **48**, 247; *Proc. Soc. exp. Biol. N.Y.* 1928, **26**, 207.

New Inventions

A PRECISION CLIP APPLICATOR

FOR several years I have been using a silver clip applicator that includes a hook which automatically pulls the vessel into an exact position for occlusion by the limbs of the silver clip. The action of the mechanism for primarily drawing the vessel into position is an integral part of the clip applicator and works synchronously with the approximation of the silver clip limbs (see figure). The mechanism is so designed that the hook completes its action, drawing the vessel into position, before the clip has closed more than ten per cent.



Precision clip applicator in open position.

I have used this clip applicator mostly in occluding major branches of the circle of Willis in order to trap aneurysms. It has been used for getting behind aneurysms and drawing their neck into a precise position within the clip. The instrument has been found quite useful for holding and clipping the stalk in pituitary-stalk sections or hypophysectomies. With it the identification of the stalk and pulling it into position within the silver clip are straightforward.

With the usual applicator the clip may not be applied properly unless the vessel is dissected free and lifted away from the brain tissue, or unless the applicator is pressed against the tissue to force the vessel within the clip. This instrument has been found useful not only in dissecting out the vessel from the pial and arachnoidal attachments but also in automatically lifting the vessel a millimetre or two away from the tissue surface for precision clipping, the principal contact being with the vessel occluded. The instrument has also been found useful for precise clipping in deep small openings where depth perception is difficult. By use of the hook, the vessel can be properly oriented to the clip and mechanically drawn into the proper position for clipping. A standard MacKenzie clip-rack can be used by merely grinding off the foot of the rack on the hook side, which allows the hook to drop down so that the tips of the clip applicator can assume their usual position.

No serious disadvantages have been found in the use of this clip applicator except that caution must be exercised, as with any surgical instrument, when advancing into or coming away from the wound.

I wish to thank Mr. J. A. Jones, machinist, for his assistance in the making of the pilot instrument.

Division of Neurological Surgery, Medical College of Georgia, Augusta, U.S.A.
GEORGE W. SMITH M.D.

Reviews of Books

Sir Charles Bell

His Life and Times. Sir GORDON GORDON-TAYLOR, K.B.E., C.B., F.R.C.S., consulting surgeon, Middlesex Hospital, London; E. W. WALLS, M.D., B.SC., F.R.C.S.E., S. A. Courtauld professor of anatomy, Middlesex Hospital Medical School. Edinburgh: E. & S. Livingstone. 1958. Pp. 288. 42*s*.

WITH characteristic vigour, Sir Gordon Gordon-Taylor has chosen to mark his 80th birthday by collaborating with Professor Walls in the production of an erudite and intensely interesting study of their great predecessor at the Middlesex Hospital. When Charles Bell first came to London, in 1804, he was already widely known as the author of two anatomical textbooks. Two years later the appearance of his *Essays on the Anatomy of Expression in Painting* revealed him not only as an expert anatomist but also as one possessed of the "most exquisite taste and feeling for sculpture and painting". In due course he was appointed surgeon to the Middlesex Hospital, and published the first of the series of papers upon the structure and function of the nervous system for which he is chiefly remembered today—and round which was waged his unhappy controversy with Magendie of Paris.

In any age, Bell would have provided material for a lengthy and valuable biography; but he also lived in a period of great political, military, and intellectual excitement. (When Waterloo was fought, Bell crossed to Brussels and worked among the wounded for three days, with scarcely as many hours' sleep.) His contemporaries were such men as Abernethy and Astley Cooper, Syme and Dupuytren, and an important characteristic of this book is the way in which Bell is at all times shown in relation to a carefully detailed background. (It is strange, though, that no mention is made of Abraham Colles, who was born the year before Bell, and died a year later. Like Bell, he graduated at Edinburgh and, like him, was hospitably received by Astley Cooper when he moved to London.)

A useful appendix of 90 pages includes a reproduction in its entirety of Bell's *Idea of a New Anatomy of the Brain*, and much hitherto unpublished correspondence about him. Appendices usually go unread, but this one, with its notes about the Resurrection Men, the Waterloo casualties, and Bell's first cases of the palsy which perpetuates his name, is likely to engage and reward the reader's interest as much as the fascinating pages which precede it.

High Arterial Pressure

F. H. SMIRK, M.D., F.R.C.P., F.R.A.C.P., professor of medicine, University of Otago, Dunedin, New Zealand. Oxford: Blackwell Scientific Publications. 1958. Pp. 764. 75*s*.

FOR many years Professor Smirk has studied patients with hypertension, and his wide experience is set out in this comprehensive volume.

In the early chapters he introduces the concept of the "basal blood-pressure", the importance of which becomes increasingly clear later. Succeeding chapters are concerned with, inter alia, the natural history of hypertension and the effect of environment on the blood-pressure, and the clinical manifestations of hypertension and the physiology of blood-pressure regulation. Experimental hypertension is covered fully; and an excellent chapter on the pathogenesis of high blood-pressure—dangerous ground skilfully negotiated—prefaces the chapter dealing with treatment. Professor Smirk assesses all the well-known and several less well-known hypotensive agents and procedures carefully and fairly, though he leaves no doubt as to his own preference for ganglion-blocking agents. The management of patients with hypertension is discussed usefully in great detail. Precise details of certain aspects of treatment are contained in six appendices; and a seventh covers, with admirable brevity, papers published late in 1956 and in 1957 during the printing of the book.

Professor Smirk has provided from his own experience and from a comprehensive survey of the literature both a work of reference and a book which should be read by all clinicians undertaking the care of patients with high arterial pressure.

Tumours of the Soft Somatic Tissues

GEORGE T. PACK, M.D., LL.D., F.A.C.S., attending surgeon, Memorial Center for Cancer and Allied Diseases; IRVING M. ARIEL, M.D., F.A.C.S., associate clinical professor of surgery and associate attending surgeon, New York Medical College. London: Cassell. 1958. Pp. 820. 231*s*.

EVERY surgeon, whether he works in a general or a specialised field, encounters from time to time a tumour which causes him more worry and doubt than half a dozen ordinary neoplasms. Such a tumour is very often derived from "soft somatic tissues"—fascia, muscles, synovia, blood-vessels, or nerves—and there are several reasons why it poses special problems. Sarcomas, synoviomas, and malignant neurilemmomas are rare, and few surgeons can draw on a considerable experience of them; pathologists sometimes give opinions about biopsy specimens at variance with the clinical features; and publications on them are found to consist largely of monographs listing a small number of cases not consistently treated. No book at all has previously been published on this important group of tumours as a whole.

The present volume, then, meets a real need. It represents the experience of a group of internationally famous surgeons, who were for the most part dealing with the unrivalled material of the New York Memorial Center. This is essentially a practical manual on the management of actual cases, and the authors are at pains to stress that many factors besides the histogenesis of the tumour must be considered when planning treatment. The price may seem rather high. But the volume is beautifully produced, and illustrated with five hundred excellent photographs and drawings. The surgeon who buys a copy now will derive an unusual and pleasurable sensation from handling a book the title of which is likely to become very familiar in medical literature.

Erythroblastosis Fetalis

FRED H. ALLEN, JR., M.D., clinical associate in pædiatrics, and LOUIS K. DIAMOND, M.D., associate professor of pædiatrics, Harvard Medical School. Boston: Little, Brown & Co. London: J. & A. Churchill. 1958. Pp. 143. 30*s*.

THIS short book is one of a series of collections of articles on medical progress originally published in the *New England Journal of Medicine;* the articles on which it is largely based were published in October, 1957. The book contains a remarkable amount of information and includes a useful glossary of technical terms. A succinct account of the blood-group factors, including rare ones, is given; the mechanism of production of the syndrome is clearly discussed and diagnosis fully dealt with. The technique the authors use for exchange transfusion is given in some detail. In this country the tests and manœuvres described would all be carried out in the children's department of a hospital, and the finer points of blood-grouping are dealt with by the National Blood Transfusion Service centres. Nevertheless all who deal with newborn children will find this book useful, and our only regret is that its price, excessive for this country, will keep it resting on the library shelf instead of in the resident's pocket.

Obstetric Practice

H. BRUCE WILLIAMS, CH.M., F.R.A.C.S., F.R.C.O.G., lecturer in clinical obstetrics, King George V Hospital and University of Sydney. Sydney and London: Angus & Robertson. 1957. Pp. 168. 25*s*.

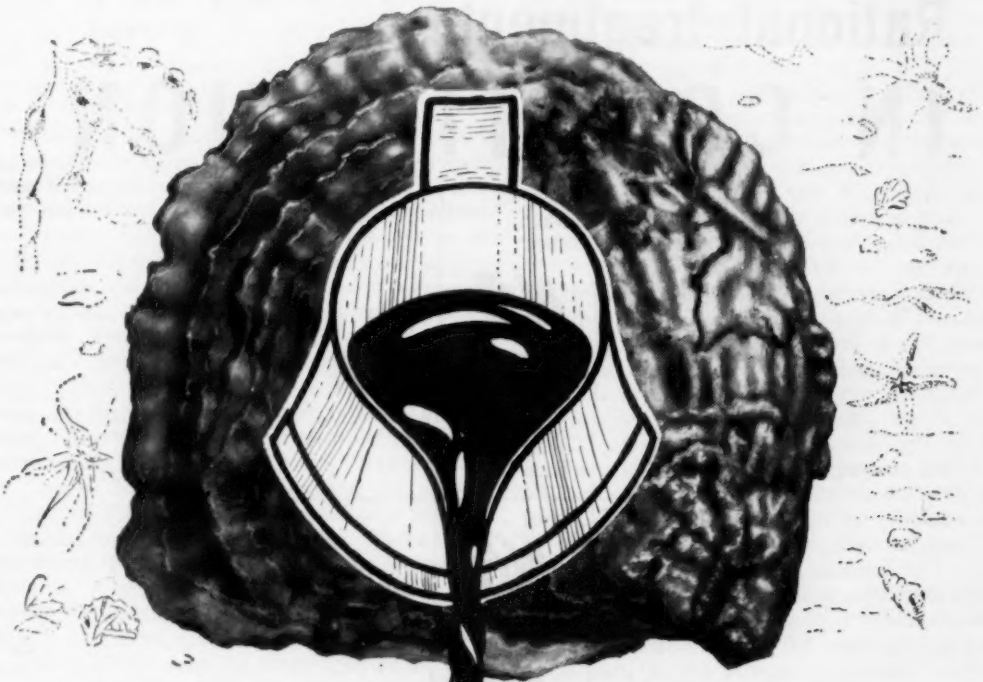
IN his handbook of abnormal obstetric practice (it does not deal with the normal) Mr. Williams discusses the diagnosis and treatment of the complications of pregnancy and labour. The brevity with which he has chosen to do this has necessitated some sweeping generalisations; for examples, "Endeavour to assess the size and weight of the child, for a very large child cannot be delivered by the vaginal route"; "Remember that if you do a vaginal examination and can feel the sacrum, the diagonal conjugate is reduced, and therefore the child of normal size could not be delivered per vias naturales"; "The patient may be a multipara with previous normal deliveries of normal sized infants, thus excluding pelvic contraction"; and "The causes of fœtal distress during labour are (*a*) short cord, (*b*) prolapse of the cord". For those with little experience of obstetrics, such an approach is seldom suitable. The classifications would not all meet with general favour: thus the causes of habitual premature interruption of pregnancy are given as (1) diseased cervix, (2) no apparent cause, (3) other causes which are not diagnosed; and the causes of inversion of the uterus are grouped as (1) incorrect management of the third stage of labour, (2) spontaneous inversion, for example (i) pressure on the fundus of an atonic uterus or (ii) pulling on the cord.

Although there is much that is interesting in Mr. Williams' many original views, his book is unlikely to commend itself to teachers who favour a more orthodox text for their students.

The Tissues of the Body (4th ed. London: Oxford University Press. 1958. Pp. 415. 40*s*.).—It is not quite twenty years since Prof. W. E. Le Gros Clark's book first appeared; yet it can already be counted one of the classic texts of anatomy. In this new edition he has pursued his policy of bringing to the notice of his students not only the tried principles and generalities of the subject but also some frequent glimpses of "the advancing front of scientific adventure". It is for this reason that this book is by far the best introduction to the study of anatomy. It educates, stimulates, and evokes the critical spirit proper to youth. Few anatomists of today could claim such a wide and up-to-date acquaintance with the multifarious activities of their fellows as can Professor Le Gros Clark. His book is, indeed, not merely a superb introduction for the novice in anatomy, but almost equally valuable to the professional as a periodic review of progress in the subject.

Clinical Heart Disease (5th ed. London: W. B. Saunders. 1958. Pp. 673. 66*s*. 6*d*.).—This excellent book by Prof. Samuel A. Levine, of Harvard, has expanded greatly since it was first written in 1936, but it has remained a great favourite both with medical students and physicians. It was practical, clinical, eminently readable, and not too long. Unfortunately, it had lately become out of date, and it is a pleasure to find that this has now been remedied. Two sections have been added, both by well-known authors and both excellent. One is on congenital heart-disease by Dr. Alexander Nadas, cardiologist to the Children's Hospital at Boston and himself the author of a well-known book on congenital heart-disease. His section is of only 32 pages, which seems small in a volume which has now been expanded to 673 pages, but that is perhaps the correct proportion for the adult cardiologist. The lack of illustrations in this section is disappointing, but it is in keeping with the rest of the book, except for the section on electrocardiography. In this large section by Dr. Harold Levine, who is in charge of electrocardiography at the Peter Bent Brigham Hospital, vectorcardiograms are shown and described with the electrocardiograms, but are difficult to "read" and are not married with the description of the electrocardiograms, as perhaps they should be in a textbook of this sort. This is not the right book for those who like the physiological approach. It is poor on the venous pulse, and auscultation sometimes does not receive the emphasis that one would expect from Professor Levine, especially in the section on acute rheumatic carditis. Nevertheless the text can be read and enjoyed, and remembered by its good clinical sense and anecdotes in a way that is most unusual in a specialised monograph.

Spinal Anesthesia (Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1958. Pp. 61. 22*s*. 6*d*.).—Prof. John B. Dillon, of the University of California Medical Center, here presents a very concise account of the essential practical facts concerning spinal anæsthesia. He has written it for residents in anæsthesia and for those who practise spinal anæsthesia but who have had neither the time nor the opportunity to explore some of its aspects. He provides a useful introduction for residents; but the book is unlikely to appeal to those who practise anæsthesia, because it does not attempt to appraise deeply the physiological and pathological implications of the technique.



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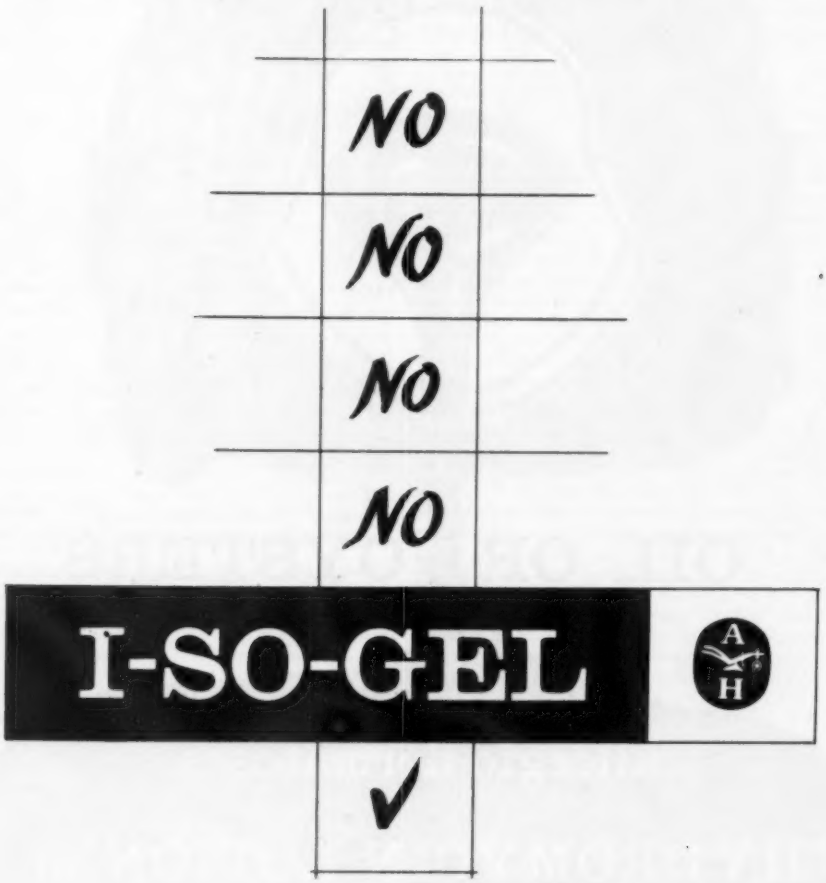

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Bacterial Endocarditis

BEFORE the introduction of chemotherapy bacterial endocarditis was almost invariably fatal, but even today probably one in every four patients succumbs. FRIEDBERG [1] has shown that this is due mainly to delay in treatment arising from errors in diagnosis, and to the inadequate treatment of patients with resistant organisms. Patients over the age of 40 and those with persistently negative blood-cultures [2] have an appreciably greater mortality. Treatment should be started at the earliest suspicion—unexplained fever, anæmia, splenic enlargement, or changing murmurs, accompanying a cardiac lesion. Eradication of organisms deeply buried in vegetations depends on their being reached by adequate concentrations of an antibiotic to which they are sensitive; and as host defence mechanisms are virtually impotent in these situations, the antibiotic must be bactericidal rather than bacteriostatic.[3] EAGLE et al.[4] have shown in experimental lesions that the rate of destruction of organisms by penicillin depends on their susceptibility and the total time that an effective concentration is maintained at the site of infection; the greater the number of organisms, the longer must be the treatment. EAGLE et al.[5] also deduced that in their experiments a serum level five to twenty times the minimum inhibitory level in vitro was required, and it is likely that even higher levels are required in bacterial endocarditis to ensure diffusion into the vegetations. Such levels cannot be attained with depot preparations. The failure of penicillin in adequate doses to cure some patients, even though the organisms are sensitive, may be the result of a heavy concentration of organisms in the vegetation [4]; in these conditions organisms multiply only very slowly, and accordingly penicillin is largely ineffective. The combination of penicillin with streptomycin has been shown in vitro by HUNTER [6] to overcome this difficulty; such a combination is highly bactericidal.

FINLAND [7] has recently reviewed the present position regarding treatment. Whenever possible the organism should be isolated, but there is little advantage in taking blood-cultures for longer than forty-eight hours since GRIFFITH and LEVINSON [8] found that 98% of positive results were obtained in this time. Treatment should be started during incubation of the cultures, and the choice of antibiotic depends upon the probable organism. Almost any organism can cause the disease, but *Streptococcus viridans* is easily the commonest; enterococci are more likely after genitourinary operations, and staphylococci after cardiac surgery. FINLAND recommends penicillin whenever the organism is highly or moderately sensitive, but streptomycin should be added if more than 0·2 unit per ml. is required for inhibition in vitro, and in all enterococcal infections. None of the tetracyclines or chloramphenicol should ever be used alone where gram-positive organisms have been isolated, even when these are sensitive in vitro and despite occasional reports of cure; negative blood-cultures and clinical improvement may usually be obtained, but relapse almost always follows. Streptomycin and erythromycin must never be given alone, for fear of resistance developing; and sulphonamides seem to have no place. Short courses of treatment have been tried, particularly in the U.S.A.; and HUNTER and PATERSON [9] have reported a relapse-rate of only 6% in 146 patients treated for fourteen days with up to 12 million units of penicillin and 2 g. streptomycin daily. TOMPSETT et al.[10] found that 24 patients out of 35 were cured after a similar period by 6 million units of penicillin and 1 g. streptomycin daily; they regarded a further 8 as " probable cures ". KELLOW and DOWLING [11] claim that a course of only ten days is necessary in infections with streptococci inhibited by 0·5 unit per ml.; but this hardly accords with general experience, and FINLAND prefers the recommendations of HUNTER and PATERSON. Thus, when the organism is a highly sensitive streptococcus, inhibited by 0·1 unit per ml. or less, a fourteen-day course may be given consisting of 2 million units of penicillin daily combined with 2 g. streptomycin daily in the first week and 1 g. streptomycin daily in the second. Organisms sensitive to 0·2 unit per ml. require 8 million units daily for two weeks followed by 4 million units daily for three weeks, combined with 1 g. streptomycin daily. If the organism is only sensitive to 1 unit per ml. or more, the course should be 12 million units daily for three weeks and subsequently 4 million units for four weeks: streptomycin 1 g. daily is given throughout, and probenecid 0·5 g. six-hourly is added to enhance penicillin blood-levels. Isolation of an enterococcus demands this last programme as a minimum; and if the organism is relatively insensitive, up to 20 million units of penicillin daily is advisable, administered if necessary by constant intravenous infusion. Staphylococci sensitive to 1 unit per ml. are best dealt with by administering 12 million units of penicillin daily combined with probenecid for six weeks; and more resistant staphylococci must be treated simultaneously with two antibiotics to which the organism has been found moderately or highly sensitive. Such combinations might be erythromycin or novobiocin with streptomycin, chloramphenicol, or a tetracycline; or chloramphenicol with streptomycin. Bacitracin may be needed if the position is desperate. Probenecid blocks the excretion of penicillin only and is useless with other antibiotics. For less common organisms, treatment can be planned only in the light of known sensitivity.

Such recommendations may seem complex; but inadequate or misdirected treatment, while inducing a temporary quiescent phase, may also induce resistance in the infecting organism, and thus make ultimate eradication more difficult. Early diagnosis or, preferably,

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11. Kellow, W. F., Dowling, H. F. *Arch. intern. Med.* 1957, **100**, 322.

prophylaxis [12] offers the best prospect. If any doubt exists it is only prudent to prescribe the longer course, and in every case unremitting watch must be kept for any sign of relapse.

Bone-marrow Transplantation in Blood Diseases

LAST year we drew attention to experimental work on the transplanting of bone-marrow to animals whose own marrow had been inactivated by exposure to radiation.[13] These experiments had shown that, if suspensions of bone-marrow cells from healthy animals are injected intravenously into the irradiated animals, not only do a large proportion of the latter survive an otherwise fatal dose of irradiation, but also there is evidence that the donor cells proliferate in the host's marrow. This discovery had been applied to the therapy of animals with transmitted leukæmia; they were exposed to a dose of X-radiation sufficient to destroy the bone-marrow, and then normal marrow cells were given; in some cases proliferating donor marrow replaced the former leukæmic marrow and the animals survived for some time. The possibility of transplanting healthy marrow to patients with blood diseases has been explored with great energy. The technique should be applicable to patients who have aplastic anæmia, or whose marrow has been rendered aplastic by exposure to radiation or by drugs such as nitrogen mustard or busulphan ('Myleran') given for the treatment of leukæmia, Hodgkin's disease, or similar conditions, or in an attempt to relieve the symptoms of malignant tumours. Last October a conference on these matters was held at Boston, Mass., under the general chairmanship of Dr. SHIELDS WARREN and Dr. WILLIAM DAMESHEK, and the proceedings have been reported in *Blood*.[14]

In the first session sources of bone-marrow and techniques for its preservation and administration were discussed. L. M. TOCANTINS used ribs removed at thoracotomy operations, and he could get 10–15 specimens weekly; a 7–8 in. length of rib yielded 6×10^8 to 6×10^9 cells; but he pointed out that, since adult cells are of little value to the recipient, the differential count should be known. He also used marrow obtained from the vertebræ of cadavers, removed with sterile precautions within two hours after death. WILLIAM MCFARLAND obtained marrow by aspiration from the posterior ilium with a Bierman needle [15]; the marrow was aspirated into heparinised saline, and $1–4\times10^9$ nucleated cells were obtained from a single donor. He also used cadaver marrow obtained from the sternum as well as the vertebræ. E. D. THOMAS preferred marrow from fœtal sources when possible; $2–4\times10^9$ cells are obtainable from the four long bones; he forced the marrow through graded stainless-steel meshes [16] to obtain an even suspension of cells. W. H. CROSBY and J. AKEROYD had used whole-rib transplants; in these transplants the rib bone disappears and is replaced by fibrous tissue, and marrow later regrows within this fibrous tissue. The bone-marrow suspension obtained from these various sources either has been given within three hours after preparation or has been preserved in glycerin by the Polge technique and stored at −70 to −80°C.

The second session was devoted to the immunological difficulties when donor tissues are given to hosts that are not identical—difficulties that have often proved a bar to long-term survival. C. C. CONGDON stated the problem shortly. Normally mice live for 29–35 months; after lethal irradiation they die within ten days, but if given injections of healthy bone-marrow they survive and apparently recover. But thirty to ninety days after irradiation followed by marrow treatment they begin to die, and all are dead by nine to ten months after exposure. This late fatality is an immune reaction due to the presence of foreign bone-marrow. T. MAKINODAN recalled that mice given lethal irradiation can be protected by either mouse marrow or rat marrow, which proliferates under these circumstances.[13] With rat marrow the late death-rate was increased and the animals showed a syndrome of loss of body-weight, increase of beta and gamma serum-globulins, and slow reaction to introduced antigens. MAKINODAN suggested that there were good reasons for supposing that the late deaths were due to reactions of the host to the transplant, and therefore the amount of marrow injected should be kept to the minimum and as much extraneous tissue as possible should be removed. J. J. TRENTIN pointed out that marrow used in these protection experiments can be autologous, isologous (same genotype as the recipient), homologous (same species but different genotype), or heterologous (e.g., rat into mouse). The late-mortality disease occurs in mice protected with homologous or heterologous marrow, but not when isologous or autologous marrow. The "heterologous disease" is more severe than the "homologous disease", and the homologous disease is worse with certain kinds of genotype incompatibility. TRENTIN, unlike MAKINODAN, believes that the late fatality is due to reaction of the *donor* tissue, probably the transplanted lymphoid elements, against the tissue antigens of the otherwise tolerant host; and he points out that there is no secondary hæmopoietic depression and that skin grafts from the marrow donor into the host will persist. TRENTIN also drew attention to an earlier type of mortality when high but sublethal doses of irradiation were followed by a dose of homologous marrow of the order needed to protect against lethal irradiation. This earlier mortality is associated with secondary hæmopoietic depression and appears to be related to the ability of the host to reject transplanted homologous marrow—a sort of reaction that may well be observed in the clinical application of marrow transplantation.

In the third session clinical results were discussed. MCFARLAND reported on 6 cases of aplastic anæmia cared for by DAMESHEK's group. Bone-marrow from posterior ilium was obtained from donors whose blood type was as near as possible to that of the recipient. Each patient received one to three infusions a day for five to seven days; this meant using for each patient

12. Wedgwood, J. *Lancet*, 1957, ii, 922.
13. *Lancet*, 1957, ii, 127.
14. *Blood*, 1958, **13**, p. 288 et seq.
15. Bierman, H. R., Kelly, K. H. *ibid*. 1956, **11**, 370.
16. Thomas, E. D. *ibid*. 1955, **10**, 600.

marrow from eight to twelve donors and taking between $0{\cdot}95\times10^9$ and 2×10^9 cells per donor. In one later case only one donor was used, large amounts of marrow being obtained from both posterior ilia. Large doses of corticosteroids were given in order to reduce the immune reactions. So far encouraging results have been obtained in all the patients. ATKINSON of Philadelphia mentioned the case of a child with acute leukæmia who was treated with radiation followed by marrow infusion, the donor being the patient's identical twin. The child, who was also given corticosteroids before and during therapy, was " packed in rice and rotated to give equal exposure. The entrance dose was calculated to be 400r and the exit dose 240r." The irradiation made the child very ill, and she was nearly dying when given an infusion of $2{\cdot}65\times10^9$ marrow cells. In twenty-four hours the clinical condition was much improved, and in two weeks there was evidence of a remission; unfortunately this did not last long. KRETCHMER of Oak Ridge reported results with 2 cases of leukæmia which had relapsed after prednisolone treatment; the patients were given X rays followed by marrow infusion, and were very ill afterwards. In 1 patient the marrow was obtained from the patient's mother, who had a different minor group antigen; several infusions were given. The patient eventually improved somewhat, and some months later there was still evidence that donor cells were present. Earlier, TOCANTINS had reported results of marrow infusions in 7 leukæmic patients whose own marrow had become hypoplastic after chemotherapy. 2 patients had " notable cellular responses ". He also mentioned a 16-year-old patient with terminal leukæmia and a low bone-marrow count who was given 150r total body irradiation followed two days later by marrow transfusions containing $5{\cdot}4\times10^9$ nucleated cells; there was a complete clinical and marrow remission which had persisted for four months at the time of the report.

A fourth session dealt with chemical compounds that protect bone-marrow from radiation; an aminoethylthicuronium compound was shown to enable larger doses of irradiation to be given safely to mice with localised lymphomas, with correspondingly greater reduction in the size of the tumours.

Summarising, the report states that practical problems of obtaining, preserving, and administering marrow can all be worked out. But

" the big ' catch ' in the whole thing was the immunologic reaction. How could this be handled? As yet no good technics had been evolved and it was probably best to proceed with the transplantation technics, learn as much as possible about them, and hope that tolerance for introduced marrow might be established and that anti-immune methods might be worked out. Whether or not attempted destruction of leukæmic tissue (and normal marrow) followed by attempts at marrow repopulation had some chance of being successful remained to be seen. At this writing, it seemed doubtful, not only because the leukemic tissue (or the proliferating stimulus) could not easily be overcome by radiation, but because the immunologic process was probably resistant to the doses of radiation that could be used in the human without fatality."

HELLER and YAKULIS [17] have lately described the case of a man with Hodgkin's disease whose marrow had become aplastic after the administration of tretamine (T.E.M.). He was given an intravenous injection of marrow pooled from four suitable donors. The patient's genotype was O, M, CDe/cDe; four of the donors were N-positive and two were E-positive. The treatment was followed by recovery, and N and E erythrocytes were still detectable in the peripheral blood ninety-eight days after the infusion; after that they declined and none of these foreign cells could be found a hundred and forty days later. HELLER and YAKULIS remark that so far few similar reports have appeared. This is true enough. THOMAS et al.[18] reported 6 cases in September, 1957; their results were not impressive, a temporary " take " of the marrow transplant being found in only 2; but some of their patients were very ill and 3 died within fifty days from their primary disease. HUMBLE and NEWTON [19] gave marrow to 5 patients, but they were concerned only to show that such infusions were technically possible and had no immediate ill effects. The reason for the paucity of reports may be found in the difficulties that were discussed at the Boston conference, and it is clear that marrow infusion is not a treatment to be lightly undertaken. FERREBEE [20] estimates that from 2×10^9 to 20×10^9 nucleated marrow cells are needed for repopulation of the marrow space of a man. But these reports show that, despite discouragements, the possibility of using marrow transplantation is being carefully studied, and already hopeful results have been obtained in aplastic anæmia.

17. Heller, P., Yakulis, V. *Lancet*, 1958, i, 1131.

Preventable

THIS is the time of year when messages come from tankers in the Persian Gulf saying that some member of the crew is ill, or has died, from the effects of heat. The deaths may not be many, but they are very distressing; for the person who dies is usually a young man who a few days previously was in ordinary health. In their paper this week Dr. LEITHEAD and his colleagues give a clear account of heat illness as seen when the patients are landed at an oil-town in Kuwait, and they explain where the dangers lie. We earnestly hope that, with this additional evidence before them, the shipowners and Government authorities concerned will consider what more can be done to stop these unnecessary and tragically useless deaths.

Of course a great deal has been done already. Many tankers have cooling systems for messrooms and sickbays; some now have air-conditioning of living quarters; and all must fulfil conditions of heat insulation laid down by the Ministry of Transport. None, however, have yet achieved the special system of " tropicalisation " used in the Royal Navy. Though amenities have so much improved, the short voyages from this country to the Gulf ports can still put a big strain on human adaptability to contrast. After exposure to the coolness of an English summer, the crew may have hardly begun to adjust to heat before it strikes them (" like a sword ", as T. E. LAWRENCE said) when they leave the Suez Canal.

18. Thomas, E. D., Lochte, H. L., Jr., Wan Ling Chu, Ferrebee, J. W. *New Engl. J. Med.* 1957, **257**, 491.
19. Humble, J. G., Newton, K. A. *Lancet*, 1958, i, 142.
20. Ferrebee, J. W. *Blood*, 1958, **13**, 273.

On each voyage, acclimatisation must be achieved almost afresh, and there is a danger period, of a week or more, until the body has learnt to conserve salt by reducing the salt content of the sweat.

Young men are casual, and a certain foolhardiness befits seafarers. But these are poor consolations after a man has died because he did not bother to take extra salt at meals, or thought the suggestion soft. Surely, people who make use of scientific discoveries, and live the new kind of lives that science has made possible, ought to be willing to listen also to what science says about the preservation of their health and safety in the new artificial environments? But the necessary knowledge needs to be supplied to them repeatedly and with conviction; and, though many senior officers are interested, they mostly lack time for promoting preventive medicine in detail. Of course, if the ship has a doctor, he will be able to overcome irrelevant prejudices and make the crew understand that salt deficiency is something which anyone but a fool will take trouble to avoid. But ships with fewer than 100 people on board do not have to carry a doctor.

Dr. LEITHEAD and his colleagues suggest various ways in which the risks of these voyages could be reduced. But there is another that leaps to the eye. Granted that one cannot expect to have a fully qualified medical man in every vessel at sea, why should there be this immense difference between the medical care of 101 men, who *must* have a registered medical practitioner, and of 99 who need have nobody trained to advise them or attend wisely to those minor illnesses which in the tropics are so uncomfortably liable to become major? Many years have now passed since the Association of Sea and Air Port Health Authorities recommended that the smaller ships should each carry a sickbay steward. We must ask why this is not yet done.

Annotations

ORIGINS OF SOCIAL PSYCHIATRY

IT is commonly believed that a real increase in mental breakdown is following on the raised tempo of modern life and our rapid cultural changes. Unfortunately the statistics are still so fallible, and the boundaries of mental health and illness so hazy, that fact can scarcely be distinguished from fallacy—let alone from fantasy. Some aspects of the "horizontal" approach, as it were, to culture and mental illness by G. M. Carstairs in his anthropological work were lately reviewed in these columns [1]; and on July 8 at the Institute of Psychiatry, London, Prof. George Rosen, of Columbia University, presented a "vertical" or longitudinal view.

In a scholarly address he pointed out that the concept of sociocultural determination in mental illness is not by any means new. Benjamin Rush studied the effects of the American Revolution on the participants: being an ardent revolutionary himself, he noticed among his ranks an increase in health and happiness, the cure of hysterical disorders among the women, and blessings granted to previously infertile marriages. Among those still loyal to the British, however, mental and physical breakdowns were common, and a particular type of hypochondriasis ("protection fever") was described. After the peace of 1783, unwonted freedom led to a further form of insanity called by him "anarchia". Although French writers had noted mental accompaniments to their revolution, it seemed that Rush (though not entirely unbiased) could be credited with one of the earliest attempts to establish a causal correlation between social upheaval and mental consequence.

This concept, as Professor Rosen explained, spread widely during the next century, and Rudolf Virchow in 1848 put forward a theory of "epidemic psychoses" indicative, he said, of major disturbances in man's life; and he distinguished between "artificial" (i.e., social) and "natural" phenomena. In the following year he carried the idea further, suggesting that mental and physical epidemics came and went at the turning-points of civilisation and could give us insight into the popular feelings of the time; but Griesinger regarded political change as an aggravating factor rather than a cause. At about the middle of the 19th century the concept of the "rising tide of madness" came to the fore, and it was slightly comforting to realise that the pessimists of today were the descendants of such a long line of Jeremiahs. On the positive side, a consequence of these views was an attack on the social structure itself with the aim of lessening the stresses therein: Hawkes in 1857 argued for wide and enlightened social reforms. Towards the end of the century a number of workers tried to provide a better factual basis by studying the incidence of insanity in different places and at different times; much evidence was in conflict, but the work of Durkheim on suicide was outstanding. Unfortunately the great discoveries in pathology and bacteriology overshadowed this work, although interest in it was now active.

Regarding future work, Professor Rosen concluded that certain social variables, such as wars, epidemics, or slumps, should be defined and studied at sociological, psychiatric, and physiological levels, and along the time axis. He hoped that the historian, by clarifying issues in terms of their backgrounds and showing linkages not readily apparent, could make some contribution to the multidisciplinary approach. Few would disagree with him.

1. *Lancet*, 1958, i, 419.

CONGENITAL MALFORMATIONS

IT has been apparent for many years that the best way to study associations between events in the early months of pregnancy and congenital malformations is prospectively. To go back into the pregnancy history after the birth of the malformed child is, in general, unsatisfactory, unless the investigation is carefully controlled. This method led to an overestimate of the risk to the fœtus after rubella; Hill et al.[1] now estimate from prospective studies that the risk of major defect is 50% in the first month, 25% in the second, and 17% in the third. They suggest, however, that the risk may vary from year to year and between one counrry and another. With careful controls, Stewart et al.[2] have used the retrospective method more successfully in relation to malignant disease in childhood.

1. Hill, A. B., Doll, R., Galloway, T. McL., Hodges, J. P. W. *Brit. J. prev. soc. Med.* 1958, **12**, 1.
2. Stewart, A., Webb, J., Hewitt, D. *Brit. med. J.* 1958, i, 1495.

One method of conducting a prospective inquiry is to use the records of maternity hospitals, listing the incidents recorded in pregnancy and then noting the result of the pregnancy. Carter [3] reported a study of this kind on about 15,000 deliveries in a London maternity hospital and found that none of the commonly recorded events in pregnancy were followed by a significant increase in the rate of malformation. There was a suggestion, however, that the rate might be higher after threatened abortion; and Turnbull and Walker [4] have since also found, though again not at a high level of significance, a greater rate after threatened abortions. Hospital records, while satisfactory for such items as mother's age and parity, inevitably give incomplete information about events early in pregnancy. The ideal is for a single trained observer to make special inquiry of the mother about the third month in pregnancy, and for this observer then to await the result of the pregnancy. The first general prospective study of this kind has now been reported by Dr. Alison McDonald.[5]

McDonald interviewed 3295 mothers at the time of booking—this was mostly in the fourth or fifth month of pregnancy—at the Watford and St. Albans clinics in 1952–55. She was able to discover the outcome of 3216 of these pregnancies. There were 72 miscarriages and 63 stillbirths. Nearly all the surviving infants were examined by doctors and the majority by a pædiatrician. Necropsies were performed on all but 8 of the stillborn and all but 4 of the 35 infants who died neonatally.

Major malformations were found in 50 (1·5%) and minor malformations in 72 (2·3%). These rates agree well with those in other series of booked cases (hospital series including emergency admissions naturally show a higher rate) in which the children are not followed beyond the neonatal period. For the minor malformations there was no association with any event early in pregnancy. This was true, too, for the major malformations and threatened abortions, extramarital conception, injury, fainting, uterine retroversion, rhesus incompatibility, marked anxiety, and emotional shock. The mothers of the children with major malformations had an above-average incidence in early pregnancy of fairly heavy work, acute febrile illness, active or quiescent pulmonary tuberculosis, and anæmia. Inevitably the number of mothers affected in these ways was small and the associations do not reach high levels of significance. It is noteworthy that the 6 mothers who had a specific fever early in pregnancy (pertussis in 2, mumps in 2, rubella in 1, infectious hepatitis in 1) all had normal babies.

This survey shows how far we are from having any idea of the cause of most congenital malformations. It is known that relatively few are essentially genetically determined, though for many there is evidence of genetic predisposition. Environmental factors must be playing some part in the causation of most malformations, but none of the common events in pregnancy, and only rubella and toxoplasmosis among rare events, have been convincingly incriminated. There has been much more success in relating certain common malformations to social class, maternal age, birth-order, geography, and season of the year. These, however, afford only indirect clues, and the primary environmental factors concerned in most malformations remain unknown.

3. Carter, C. O. *J. Obstet. Gynæc., Brit. Emp.* 1950, **57**, 897.
4. Turnbull, E. P., Walker, J. *ibid.* 1956, **63**, 553.
5. McDonald, A. D. *New Engl. J. Med.* 1958, **258**, 767.

CHRONIC IDIOPATHIC JAUNDICE

IN 1954,[1] under the title a New Liver Disease, we drew attention to an apparently rare disorder of the liver reported independently by Dubin and Johnson [2] and Sprinz and Nelson.[3] In the past four years an additional 36 cases have been reported, bringing the total to 50—from which it may be inferred that the condition is by no means as rare as was at first thought by its discoverers. A summary of these 50 cases by Dubin [4] should prove a valuable basis for further work.

Dubin suggests that the fundamental defect is a genetically determined impairment of the excretory functions of the liver, which reveals itself clinically in intermittent attacks of jaundice with biliuria and sometimes pale stools. The onset may be insidious or acute, resembling an attack of infective hepatitis, or may follow some other disease or stress such as pneumonia, pregnancy, or immunisation. The attacks are usually associated with malaise, pain in the right hypochondrium, nausea, and vomiting and diarrhœa. Between the attacks the jaundice almost disappears, although in most cases the serum-bilirubin remains more or less increased. Laboratory investigations indicate an obstructive type of jaundice, since some 60% of the serum-bilirubin is of the direct-reacting variety and bile is present in the urine; and, although the serum-alkaline-phosphatase is rarely increased, there is little evidence of parenchymal damage and the serum-proteins are within normal limits. It is, therefore, hardly surprising that in 31 of these 50 patients laparotomy was undertaken for the relief of biliary obstruction; this was not found in a single case, although gallstones were present in 5. Of these first 50 patients only 9 were women; but, since the American Armed Forces Institute of Pathology was the chief case-finding source, the sex-distribution is obviously biased. The world-wide distribution of sporadic cases suggests that all ethnic groups are susceptible.

The morbid anatomy of the condition has been studied almost exclusively by biopsy, either by needle aspiration or laparotomy. The one outstanding abnormality is the remarkable colour of the liver—variously described as black, green, or mahogany—owing to accumulation in the centrilobular cells of large amounts of coarse yellow-brown pigment granules. These give histochemical reactions that identify them most closely with the lipofuscins, from which they differ mainly by their coarseness and persistence. Other hepatic abnormalities such as necrosis or fatty infiltration are rare and may be regarded as mainly incidental. Repeated biopsies with intervals of up to four years have shown no evidence of progressive hepatic injury; and this is confirmed by the complete lack of correlation between the duration of the disease and the intensity of the hepatic abnormality, as well as by the excellent prognosis as regards life expectancy.

The nature of the underlying dysfunction is still not precisely known. Since the greater part of the serum-bilirubin is of the direct-reacting variety the fault cannot be in the mechanism that converts bilirubin to its glucuronide, but is presumably in the mechanism of excretion that follows this conjugation. Other evidence of impaired excretion is obtained with bromsulphalein, and from attempts to display the gallbladder by oral cholecysto-

1. *Lancet*, 1954, ii, 1111.
2. Dubin, I. N., Johnson, F.B. *Medicine*, 1954, **33**, 155.
3. Sprinz, H., Nelson, R. S. *Ann. intern. Med.* 1954, **41**, 952.
4. Dubin, I. N. *Amer. J. Med.* 1958, **24**, 268.

graphy which were successful only once in 37 patients. The highly characteristic accumulation of pigment in the liver cells is presumably also the result of impaired excretion since the liver normally excretes lipofuscin pigment.[5,6] The biochemical steps of these various excretions are still almost unknown, and it may reasonably be hoped that much will be learnt from further studies of these cases of chronic idiopathic jaundice.

PULMONARY ALVEOLAR PROTEINOSIS

KNOWLEDGE of pulmonary pathology has been greatly extended in recent years. For instance, interstitial pneumonia due to infection with *Pneumocystis carinii* has been firmly established as an entity with characteristic histopathological changes, and progressive interstitial fibrosis of the lungs (Hamman-Rich disease) and alveolar microlithiasis have been thoroughly investigated. Now a new pulmonary disorder has been described by three distinguished pathologists from the Harvard Medical School, Yale University, and the Armed Forces Institute of Pathology.[7] Rosen et al. name the disease "pulmonary alveolar proteinosis", and their conclusions are based on study of biopsy material from 27 patients: 8 died, and in 7 of these necropsy material was available.

There was only 1 child affected; almost all the patients were aged 20–50, and males were two and a half times as commonly affected as females. The disease is chronic and its onset insidious; in some cases it is heralded by a short febrile illness; but in others there is no fever. Progressive dyspnœa and a cough, which is usually productive, are the presenting symptoms. Physical signs are few and, apart from neutrophil leucocytosis, which is common, laboratory findings have not proved informative. X-ray examination shows at the height of the illness a "fine, diffuse, perihilar, radiating, feathery or vaguely nodular, soft density" with a "butterfly" distribution. The disorder may be confused with sarcoidosis, though the hilar lymph-nodes are apparently not involved. Rosen et al. found on histological examination that the terminal air-spaces were filled with granular or homogeneous eosinophilic material which was strongly positive to periodic acid Schiff (P.A.S.). The P.A.S. reaction was reversibly blocked by acetylation but was unaltered by saliva digestion. The material stained pale blue with Hale's reduced iron method, and was metachromatic; and the metachromasia was increased by sulphation. The presence of a polysaccharide was thus well established. Lipids were demonstrable in frozen sections by Sudan and oil-red-O. Cholesterol was present but phospholipids were apparently absent. A protein component was revealed by a weak Millon reaction. Rosen et al. term the material "proteinaceous" and consider it to be the result of transformation of septal cells which increase in number and size. In all cases laminated, strongly eosinophilic, and P.A.S.-positive intra-alveolar bodies, 2–30 μ in diameter, were seen. Some of these stained deep blue with phosphotungstic-acid hæmatoxylin, and none was calcified. Rosen et al. believe that, when septal cells disintegrate, they may form a nidus for deposition of proteinaceous material and thus the formation of the laminated bodies. Cellular infiltration of interalveolar septa was absent or minimal. The honeycombed masses which are so characteristic of pneumocystic pneumonia were not seen in pulmonary alveolar proteinosis. The disorder is quite distinct from pneumocystic pneumonia and from microlithiasis alveolaris. Extensive bacteriological, virological, and serological investigations failed to disclose an organism responsible for the disease. On the other hand case-histories and histological findings suggest that the cause is inhalation of some irritant substance. Neither antibiotics nor corticoids have proved conclusively beneficial. Spontaneous improvement was not unusual; but, although some of the patients were observed for several years, in only 1 instance was clinical recovery associated with disappearance of radiographic signs.

5. Humperl, H. *Schweiz. Z. allg. Path.* 1953, **16**, 399.
6. Bachmann, K. D. *Virchows Arch.* 1953, **323**, 133.
7. Rosen, S. H., Castleman, B., Liebow, A. A. *New Engl. J. Med.* 1958, **258**, 1123.

HISTAMINE HEADACHE

FOR almost a century a type of episodic headache has been recognised in which unilateral pain is accompanied by ipsilateral nasal congestion, conjunctival suffusion with lacrimation, and often erythema of the face. It has usually been regarded as a variant of migraine. In 1939 Horton et al.[1] described it again and pointed out that it could often be precipitated by injection of histamine. In subsequent papers Horton suggested that it was due to abnormal sensitivity to histamine and could be cured by graduated desensitisation.

There is no doubt that such a discrete clinical entity exists within the group of episodic unilateral headaches. The condition is commoner in men than in women, and more recent descriptions [2,3] have added to the syndrome a tendency for the headaches to occur in groups. Thus they may come on several times a day, sometimes mainly at night, for a few weeks and may then be absent for weeks or months. If histamine is administered during a bout of attacks it rarely fails to provoke one; but between times it may not do so. Nevertheless the specific causal role which Horton assigned to histamine, and the benefits he claimed for histamine desensitisation, have not been widely confirmed. Some cases are substantially improved for a long time, but many soon relapse, and in some repeated desensitisation has no effect. Moreover antihistamines also usually prove valueless in treatment. On the other hand ergotamine tartrate commonly aborts an attack, especially if given early; and Symonds [3] has claimed good results from administration of prophylactic intramuscular ergotamine at times when a series of attacks is known to be imminent; such prophylaxis is often practicable because in many cases the attacks have a fairly fixed time of onset in the twenty-four hours. In a review of 20 cases Robinson [4] recommends ergotamine, if feasible prophylactically, as the best treatment—though he still prefers to differentiate the syndrome from migraine. It is doubtful whether this distinction can be maintained. The precise nature of migraine still escapes us, though its end-result as a localised vasomotor disorder is more clearly understood; but there is nothing which excludes the so-called histamine headache as a variant of migraine. Indeed it would seem reasonable to regard it as one of those varieties which are triggered by allergens—a view supported by its seasonal incidence in some cases.

Dr. DANIEL THOMSON, a principal medical officer of the Ministry of Health, has been appointed a deputy chief medical officer in succession to Dr. G. A. Clark, who retires on Sept. 30.

1. Horton, B. T., McLean, A. R., Craig, W. M. *Proc. Mayo Clin.* 1939, **14**, 257.
2. Ekbom, K. A. *Acta psychiat., Kbh.* 1947, suppl. 46.
3. Symonds, C. P. *Brain*, 1956, **79**, 217.
4. Robinson, B. W. *Medicine*, 1958, **37**, 161.

Congresses

CANCER

THE Seventh International Cancer Congress (under the auspices of the International Union against Cancer) was held in London from July 6 to 12, under the presidency of Sir STANFORD CADE. The first of these conferences was held in London thirty years ago. At that time no pure carcinogens were known, no hormone had been isolated in the pure state, and no inbred strain of mouse was available in this country. In the intervening years a vast amount of work has opened new ways of approach which are reflected in the membership of approximately 2500 persons and in the variety of subject treated in the 600 papers which were presented. To those who knew the earlier conferences it is strange that so little time should be devoted in this one to descriptions of new carcinogens and to pathological anatomy. The emphasis is much more upon mechanisms than upon causative agents, and there is a noteworthy attempt to relate experimental work to the disease in man. Outside the laboratory the the epidemiological approach is increasingly to the fore.

Epidemiological Studies in Cancer

As Dr. PERCY STOCKS (Britain) said to the section on population studies, the epidemiology of malignant disease can be approached through three main avenues: (1) the vital statistics of mortality from cancer of specific types in different sections of the population grouped according to the information given at the time of a national census; (2) morbidity-rates based on some system of notification and registration of cases, usually in the catchment area of cancer-treatment centres; and (3) special surveys, either retrospective or prospective, of particular subgroups in the population.

All these methods were exemplified in reports to the congress, and their general intention was to relate the onset of malignant change to environmental circumstance or personal characteristics or habits such as age, sex, race, diet, and smoking. Since, strictly speaking, we are concerned with the factors which favour the onset of cancerous disease, Dr. Stocks believes that attention should be concentrated on " inception "-rates based on the date of the onset of symptoms and signs of the cancer rather than on the conventional " incidence "-rates based on the year and age of either registration or death. He has used this approach in his own studies in a five-year survey of the Liverpool hospital region and North Wales—an area with a population of some $2^1/_2$ million.

Inception-rates were derived from death registration, where the certification of cause of death was checked by comparison with hospital and necropsy records, as well as from admissions to hospital. These inception-rates could thus be related to the various characteristics of the population in the area classified either in the usual way by age, sex, occupation, and housing, or according to the results of interviews with the patients themselves and a group of " controls " matched by age. Where the patient had died, health visitors elicited from relatives histories which, when checked against the responses given by some of these patients while in hospital, proved surprisingly accurate. At the same time, collaboration with the Medical Research Council and the Fuel Research Station allowed estimates to be made of the concentration of certain polycyclic hydrocarbons, trace elements, sulphur dioxide, and total smoke in the air at different points in the region. In the same way, samples of the soil in the gardens of patients who had died from cancer and corresponding controls were analysed for certain chemical characters and trace elements.[1] Cancer of the lung, although exhibiting the usual relationship to smoking, also appeared to be associated with local air pollution levels.

Dr. P. F. DENOIX (France) observed how vital-statistical rates could be used to compare the varying trends in mortality from cancer of the breast and uterus in different countries in recent years. In general, there seems to be a tendency for a concurrent increase in the death-rate from breast cancer and a decrease in the rate for cancer of the uterus.

Dr. E. PEDERSEN, of the Norwegian Cancer Registry, illustrated the value, actual and potential, of the efficient system of cancer registration which has been built up in his country since 1952. The records give a strong hint that such schemes, designed to stimulate interest in cancer detection, can bring cases to notice earlier; but the diagnostic cross-checks also give a useful warning against a too literal interpretation of apparent urban/rural differences in cancer mortality. On the other hand, the registration system has revealed geographical trends in mortality, such as a gradual increase in cancer of the thyroid from south to north, which are unlikely to be explained by regional differences in diagnostic facilities and skills.

Dr. Pedersen also described how in Norway advantage has been taken of the work of the Norwegian Cancer Society to elicit, by specific questions, data on menstrual and reproductive histories for a large number of presumably healthy women, whose subsequent experience of breast cancer will be determined by an intensive follow-up through the cancer registration system during the next few years.

In much less sophisticated conditions, Dr. J. HIGGINSON (South Africa) has conducted surveys of cancer incidence among the indigenous communities of Africa. Here, sample inquiries combined with sociological studies have been needed to fill in the picture which would have been obtained by routine census data in more highly developed countries. Much emphasis was placed on the results of necropsy, and Dr. Higginson affirmed that cancer of the liver, œsophagus, and sinuses and Kaposi's hæmangiosarcoma are commoner in Bantu males than in United States Whites. The Bantu female suffers excessively from cancer of the cervix. Cancer of stomach and large bowel are rare in both sexes.

Cancer of the Lung

In the United States, Dr. H. F. DORN has conducted a survey of mortality by cause among 290,000 men who in December, 1953, were holding United States Government life-assurance policies. Most of them had served in the first world war, and a detailed history of smoking habits was obtained from 83% of them. For both respondents and non-respondents, information on the cause of death was collected from death certificates and by special inquiry from the attending physicians. The results were expressed in terms of the ratio of the deaths actually observed among smokers of various kinds to the numbers expected at the age-specific death-rates among the non-smoking section of this particular insured group. Thus in

1. Stocks, P. Annual Report of the British Empire Cancer Campaign, 1957; supplement to part II. London, 1958.

total mortality this ratio ranged up to 1·58 for those who had smoked only cigarettes—i.e., they had a death-rate 58% greater than non-smokers of the same age. Regular cigar or pipe smokers, on the other hand, had a ratio of practically 1. That it is rarely too late to change is suggested by the fact that those who had given up regular cigarette smoking had a rate only 31% higher than that of non-smokers. As might have been expected from other studies, the highest ratio was for cancer of the lung; among regular cigarette smokers the rate was nearly ten times that for non-smokers. These regular smokers also suffered an increased risk of dying from diseases such as bronchitis, pleurisy, and emphysema, peptic ulcer, and cirrhosis of the liver, while their death-rate from coronary-artery disease was 63% higher than the rate for non-smokers. Some of these associations, such as cirrhosis and some forms of cardiovascular disorder, may result from the excessive consumption of alcohol to which some heavy smokers are prone; but the close correlation of lung cancer with cigarette smoking cannot be lightly dismissed.

This latest and striking confirmation of a long series of retrospective and prospective inquiries incriminating cigarette smoking as an ætiological factor in cancer of the lung gave fresh impetus to the discussion of that subject in other sections of the congress.

Dr. RICHARD DOLL reviewed some of the accumulated evidence and discussed its interpretation. Berkson [2] has suggested that the association between cigarette smoking and cancer of the lung may be an artefact produced by some peculiarity of the method of investigation. Both cigarette smoking and the certification of cause of death are subject to error, and the group observed is inevitably a biased sample of the whole population. Again, the association is not confined to cancer of the lung. These facts, Berkson asserts, may invalidate the conclusions to which they seem to lead. To this Dr. Doll retorted that, although not unique, the association of cigarette smoking with death is far closer for lung cancer than for any other cause, and that the quantitative relationship between cigarette consumption and lung-cancer death risk is remarkably constant in many studies.

That incipient cancer would stimulate the desire to smoke was unlikely, Dr. Doll thought, for smoking often begins forty years before any symptoms and signs of the disease become manifest. Nor does there seem to be any good reason to believe that such a close association is due to some third agent which is common to both cigarette smoking and the risk of lung cancer. Hereditary tendencies and air pollution may be relevant factors, but their presence is insufficient to explain the increasing incidence of the disease in cigarette smokers of the present generation. Experience with industrial and other forms of exposure to lung irritants suggests that cigarette smoking has a similar effect, in that it increases the risk of lung cancer without decreasing the risk of cancer of other sites.

The weakest points in the cigarette theory of lung-cancer causation are the similarity in the experience of those who describe themselves as inhalers and those who deny inhaling, and the disparities between the lung-cancer death-rates in countries with similar cigarette consumption. There may be physical explanations for the surprisingly favourable experience of inhalers. The irregularity of the national rates may derive from differences—e.g., in the amount of the cigarette actually smoked—which are now being investigated in several countries.

2. Berkson, J., *J. Amer. stat. Ass.*, 1958, **53**, 28.

Against these imperfections in the crude epidemiological data must be put the striking contribution to geographic pathology described by Prof. LEIV KREYBERG in a congress lecture. He pointed out that primary epithelial lung tumours do not constitute oncological entities although, in both mortality and morbidity statistics, they are treated as such. Inevitably this leads to an obscuring of the pattern of epidemic behaviour which can be clarified only by more detailed study of the histological character of the tumours themselves. A careful review of some 1000 cases suggested that lung cancers could be divided into two groups on the basis of reasonably objective criteria. Group-I tumours included squamous-cell, large-cell, and oat-cell carcinoma; group II comprised adenocarcinoma, bronchiolar-cell carcinoma, benign and malignant adenoma, and salivary-gland tumours. The importance of this distinction lies in the demonstration that group-I tumours, which increase in frequency with age, are related to exposure to irritants of all kinds including cigarette smoke; whereas the group-II tumours may occur even in young adults and with equal frequency in males and females, in different occupations and in town and country. Because of the constancy in the incidence of this second group of tumours, the ratio of group-I to group-II tumours in any unselected series of lung neoplasm may be very useful in epidemiological studies. As Professor Kreyberg showed, the ratio goes in step with the increasing incidence of lung cancer associated with cigarette consumption and may thus act as an index of changing circumstances in the natural history of the disease. He also showed that this classification could be made quite objectively without reference to the patient's smoking or other history; and if standardisation of his procedures on an international scale can be achieved, there will be a bright prospect for epidemiological studies based on comparisons of such ratios even in countries without effective registration systems.

When similar pathological distinctions were looked for in the lungs of guineapigs and rats which had been injected intrapleurally with chromite ore roast, Dr. W. C. HUEPER (U.S.A.) reported, squamous-cell carcinoma, adeno-carcinoma, and other malignant and premalignant types of change were found. The carcinogenic properties of metals and minerals such as chromium, nickel iron oxide, radioactive metals, arsenic, and asbestos have been most strongly suggested, however, by the epidemiological evidence of excessive mortality from lung cancer among men exposed to such dusts by their work.

These studies of lung-cancer mortality after occupational exposure to dusts again raised the question of air pollution in our industrial cities as a possible cause of the rising incidence in this country; and Mr. R. E. WALLER (Britain) reviewed the evidence for such an effect. He pointed to Stocks' finding of higher lung-cancer death-rate in large towns than in rural districts, but then went on to suggest that the mortality experience of successive cohorts of men in town and country was quite consistent with the gradual spread, during this century, of the habit of cigarette smoking outwards from the main population centres.

The mounting evidence against cigarette smoking has inevitably turned attention to the possibility of reducing the associated risk of lung cancer. Dr. E. L. WYNDER (U.S.A.) described a series of experiments designed to identify the carcinogenic elements in cigarette smoke and

the critical features of their production which might be modified to reduce their noxious action. Better filtration of tobaccos chosen for their low tar content is one alternative; removal of the precursors of the carcinogens produced by pyrolysis is another. He illustrated some hopeful studies on the results of variation in burning process which hold out the prospect of a worth-while modification of the burning qualities of cigarettes. As long as cigarette smoke remains for most people an incurable addiction, such modifications are the only hope of mitigating the current epidemic of lung cancer.

Mammary Cancer

Dr. CHARLES HUGGINS (U.S.A.) reviewed the hormonal ætiology and treatment of breast tumours in masterly fashion.

In a symposium on the clinical management of breast cancer, the consensus of opinion was that radiotherapy judiciously applied offers the greatest chance of improving the results of mastectomy; but in the view of Mr. HEDLEY ATKINS (Britain) the extreme radiotherapeutic techniques advocated by McWhirter still needed substantiation by a controlled trial.

Dr. C. D. HAAGENSEN (U.S.A.) stressed the importance of selecting treatment to suit the stage of the condition. He described his technique of triple biopsy of the primary tumour, the internal mammary glands, and apical axillary glands, on the results of which the decision as to treatment is largely based. In early cases thus selected he recommended radical mastectomy.

Prof. D. W. SMITHERS (Britain) reviewed the factors other than treatment which affect the prognosis, laying particular stress on the histological type of the tumour and emphasising the great difficulty in excluding biological factors when attempting to evaluate treatment.

Mr. R. S. HANDLEY (Britain) summarised his observations on the importance of spread to the internal mammary glands, especially in tumours affecting the inner half of the breast. In his series of 150 patients submitted to radical mastectomy with intercostal biopsy, who were followed for five years or more, of those with no glandular involvement 84% were alive and well, whereas of the 41 patients with involvement of both sets of nodes only 2 were alive.

Dr. M. MARGOTTINI (Italy) summarised the arguments in favour of extended radical surgery in the treatment of carcinoma of the breast. He emphasised that this operation does not increase the number of operable cases, but, in contrast to some other speakers, he thought it might improve results, though it is too early yet to reach conclusions.

Dr. F. BACLESSE (France) reported his results in the treatment of carcinoma of the breast by radiotherapy alone. Prof. S. A. KHOLDIN (U.S.S.R.) discussed the management of the disease in general, laying particular emphasis on the need to modify treatment according to the extent of spread.

Dr. A. LOUFTY ABOUL-NASR (Egypt) discussed the treatment of patients with advanced, widespread disease. He recommended oophorectomy particularly in such cases occurring before the menopause, reporting that in his experience this produced a remission in 40%. He felt that generally hormone therapy gave better results than chemotherapy.

Dr. R. LUFT (Sweden) also recommended oophorectomy for women with advanced carcinoma who were still menstruating or were only one year postmenopausal. In his experience, if this produced no remission, then no benefit was likely to follow adrenalectomy. In postmenopausal cases it is his practice to prescribe œstrogens, and if this produces a remission the patient is likely to benefit from ablation of the pituitary or adrenals. He suggested that hypophysectomy generally produced a longer and more complete remission.

It was apparent that adrenalectomy is a much more feasible routine treatment than hypophysectomy, owing to the greater and rarer skill required for the latter operation. But implantation of radioactive yttrium into the hypophysis (described by Mr. A. P. M. FORREST [Britain]), causing more or less total destruction, may in future be practised at many centres if a more reproducible technique proves effective.

As regards the important decision whether abortion is justified in mammary cancer occurring during pregnancy, the general opinion was that this was desirable only during the first trimester, and that the hormonal conditions during the latter stages often antagonised the disease.

At this panel meeting a wide range of questions was submitted by the audience. The different opinions expressed by the experts emphasised in a dramatic and stimulating way that advanced thought on this subject is now passing through a shifting, formative phase.

In experimental mammary carcinogenesis Dr. HUGGINS and Dr. HARRY SHAY (U.S.A.) showed the value of intensive limited carcinogen treatment of rats to produce either dependent mammary neoplasms or latent carcinomas on which hormonal influences could be investigated.

Cancer Detection by Cytological Methods

Dr. RUTH GRAHAM (U.S.A.) and Prof. H. C. MCLAREN (Britain) described methods of screening patients for carcinoma of the cervix in a cancer hospital and a general gynæcological clinic respectively. The number of patients investigated is impressive—amounting to many thousands—and Professor McLaren was clear that this method is of little value in the detection of invasive cervical cancer (where clinical methods of diagnosis are adequate) but would pick up 4–5 cases per 1000 of "carcinoma in situ." The problem is then how to treat these patients, who should be able to expect a cure. Half may be cured by ring biopsy, but the remainder will eventually need hysterectomy and all must be kept under constant cytological investigation.

Dr. L. V. ACKERMAN (U.S.A.) discussed cytological examination of the spectrum after aerosol stimulation of the air passages, and suggested that all men over 40 years of age who are heavy smokers and live in a polluted atmosphere should be screened in this way.

Prof. J. B. DUGUID (Britain) described his personal change of opinion in regard to the cytological examination of gastric washings for diagnosis of early stomach cancer and emphasised some very important points. This is not the kind of work for a small hospital laboratory—it is the work of a specialist. The surgeon and the pathologist should be aware of the difficulties, and of the need for an adequate specimen, representing all parts of the stomach mucosa and reaching the laboratory quickly. Malignant cells will rarely be present in large numbers, repeated examinations may be necessary, and it will not always be possible to say whether the cells seen are malignant or not.

Running through these papers was the knowledge that these examinations are costly and time-consuming. It is computed that to screen 6000 persons for cervical carci-

noma, 1000 hours at the microscope are required. Suggestions for selection of patients for screening tests included omission of those under 30; those who have not borne children; and practising Jewish women, in whom cancer of the cervix is rare. A point of controversy concerned the responsibility for the diagnosis. Professor McLAREN thought that the technicians who do the screening should accept responsibility for diagnosis, while Professor DUGUID thought that only a pathologist with a good knowledge of morbid histology should undertake this. It seemed clear that the help of technicians is essential for large-scale screening.

Ætiology of Cancer of the Bladder

Dr. GEORGIANA BONSER (Britain) described the work leading to the conclusion that 2-naphthylamine was carcinogenic to the bladder of man and the dog by virtue of its conversion to 2-amino-1-naphthol. Metabolic studies had revealed the importance of this transformation, and the findings had been confirmed by the technique of bladder implantation.

Dr. Bonser discussed the extension of this work to the other industrial aromatic amines and hypothetically to other chemical compounds. The orthohydroxyamines were of importance in amine carcinogenesis in general.

Prof. E. BOYLAND (Britain) described two possible ways in which the carcinogenic compounds might be liberated—namely, by the action of glucosiduronidase on glucosiduronidate, and by phosphatase on phosphate—and he discussed the possible action of enzymes on metabolites which have yet to be discovered.

Dr. W. F. MELICK (U.S.A.) described the incidence of industrial bladder tumours in workmen exposed to *p*-xenylamine. Since his original communication further tumours have been found. The degree of exposure of workmen was severe, judging from the amount of free xenylamine found in their urine, and the shortest exposure leading to the formation of a tumour was only 131 days. Dr. Melick indicated that ureteric and pelvic tumours had occurred in his series.

Dr. J. L. BILLIARD-DUCHESNE (France) surveyed the occurrence of benzidine bladder tumours in the workers in the French chemical industry. He said that this was in line with the findings in other countries with an established chemical industry. He strongly recommended the routine cystoscopy of workmen engaged in hazardous work, and that this be extended to all workpeople who had been in the industry for fifteen to twenty years.

Dr. J. CLEMMESEN (Denmark) described a statistical investigation of papilloma of the bladder amongst an urban and rural population in Denmark. His evidence suggested, although far from conclusively, that there was a connection with tobacco smoking.

A number of papers dealt with related topics. Prof. R. TRUHAUT (France), Dr. D. B. CLAYSON (Britain), and Mr. L. BRADSHAW (Britain) each described a particular aspect of the fate of an aromatic amine in the animal body. These studies showed that orthohydroxyamine conjugates were formed from benzidine and 4-aminodiphenyl. Mr. Bradshaw showed that the urine of rodents dosed with 3-hydroxy-4-nitrodiphenyl contained more 3-hydroxy-4-aminodiphenyl than did the urine of rodents to which 4-aminodiphenyl had been administered.

Dr. H. R. GUTMANN (U.S.A.) demonstrated in the case of an orthohydroxyamine derived from 2-acetylaminofluorene that protein binding was possible in simple biochemical systems.

Dr. R. R. BROWN and Dr. J. M. PRICE (U.S.A.) showed that patients suffering from cancer of the bladder often metabolised tryptophan to orthohydroxyamine derivatives more readily than normal persons. This effect is reversed if vitamin B_6 is administered. In view of the suggestive evidence of Boyland and his co-workers that 3-hydroxyanthranilic acid may be carcinogenic, this indicates a possible mechanism by which some spontaneous tumours may arise.

Carcinogenesis

Dr. I. BERENBLUM (Israel) discussed the possible relation of metabolism of carcinogens to their action and suggested that with the polycyclic hydrocarbons the evidence did not permit of any conclusion as to whether the carcinogen or its metabolite was decisive in carcinogenesis. He mentioned the possibility that hydroxylation followed by methylation preceded carcinogenesis, but again he said he could offer no evidence. With the amines, however, there was evidence that 2-amino-1-naphthol was carcinogenic, whereas 2-naphthylamine was not. Protein binding and the protein deletion hypothesis were too unspecific to lead to a satisfactory theory. The metabolsm of urethane suggested that changes in the nucleic acid induced by this chemical or its metabolites might be connected with carcinogenesis, but the evidence was not complete. In conclusion Dr. Berenblum thought that perhaps we were wrong in looking for a unifying theory of cancer, and that the disease might have multiple origins.

The use of a new experimental species in cancer research was described by Dr. H. E. POGOSIANZ (U.S.S.R.) and her collaborators, who have investigated the Steppelemming and found it to be similar to the mouse. Mouse sarcoma 180 has been transplanted into this species without the use of adjuncts to depress immunogenic resistance. This animal is resistant to ectromelia.

Dr. J. G. FORTNER (U.S.A.) has investigated the effects of implanting pellets into the gallbladder of cats. Pellets containing the known carcinogen methyl cholanthrene induced tumours, whereas pellets containing bile extracts or gallstones were negative. This worker also found a wide variety of spontaneous tumours in his colony of Syrian hamsters.

The induction of cancer of the stomach in the experimental animal remains a difficult problem. Dr. S. C. SKORYNA and his colleagues (Canada) have repeated the observation that it may be induced with carcinogen-impregnated threads; while Prof. OLAV TORGERSEN (Norway) is continuing an investigation into the effects of heated fat.

The main difficulty with the electron distillation theory is that, however precise the electron density calculations, they must be correlated with imprecise biological data.

Dr. RONALD MASON (Britain) has used the molecular orbital theory to study the forces operating between the carcinogen and the protein with which it is interacting. At present this idea does not seem to be capable of experimental test and its relation to practical carcinogenesis is obscure.

The present state of the experimental investigation of protein binding of the hydrocarbons was described by Dr. CHARLES HEIDELBERGER (U.S.A.), who believes that this is correlated with carcinogenic activity. He was unable to suggest any evidence as to the nature of the

essential enzymes which were " deleted " as a result of protein binding. Dr. D. L. WOODHOUSE (Britain) has been unable to obtain convincing evidence that protein binding is in any way specific—possibly because of experimental difficulties in the system he studied.

Immunology and Immunogenetics

Dr. E. WEILER (U.S.A.) showed that organ-specific antigens are lost from rat liver and hamster kidneys in the process of carcinogenesis. By a series of ingenious isotopic techniques combined with standard immunological methods, he found that normal hamster kidney grown in vitro also loses these organ-specific proteins after a short time. His work directly supports that of Prof. H. N. GREEN (Britain) on the immunological deletion of organ-specific antigens in carcinogenesis. But Sir MACFARLANE BURNET (Australia) in an impartial survey of the biological aspects of cancer concluded that these stimulating ideas needed more critical experimental backing.

Dr. ILSE LASNITZKI (Britain) illustrated how organ culture techniques can be applied to fundamental biological problems, and emphasised the advantage of these methods over the in-vitro cultivation of single cell species.

The evergreen topic of virus involvement in cancer ætiology attracted much discussion, but in comparison with previous times interest in this field of research seems to have diminished. In particular no-one pursued the idea that human mammary cancer was of viral origin. Sir MACFARLANE BURNET concluded that viruses have no significant role in human cancer except for possibly some part in the induction of leukæmia.

Hormones in Genesis of Cancer

Prof. O. MÜHLBOCK (Holland) presented evidence substantiating the idea that hyperhormonal pituitary stimulation can lead to cancer of the target organ. This aspect has been broadened by the Dutch workers' demonstration, described by Dr. L. M. BOOT, that breast carcinoma can be induced in milk-agent-free mice by the repeated subcutaneous implantation of pituitaries from animals of the same strain.

Ovarian carcinogenesis was discussed by several workers, among whom Prof. A. LIPSCHUTZ (Chile) made a notable contribution. He suggested that the origin of so-called granulosa cell tumours of the ovary might in some cases be in the ovarian stroma, and he described the histological changes occurring in the evolution of these tumours produced by intrasplenic grafting or subtotal castration. Apparently the sequence of changes in the two methods is similar; but in the ovarian fragments in situ the malignant transformation does not usually proceed beyond the stage of luteoma during the lifetime of the animal.

Induction of ovarian carcinogenesis by a newer method was described by Dr. J. MARCHANT (Britain), who showed that in the ovaries of mice, treated for a limited time with 9 : 10 dimethyl 1 : 2 benzanthracene, transplanted to the ovarian capsules of untreated animals, tumours still occur to the same extent and in much the same time. Normal ovaries, however, do not develop into tumours when transplanted into mice which have previously been treated with the carcinogen.

Dr. F. BIELSCHOWSKY (New Zealand) described the evolution of autonomous growth in thyroid neoplasms and correlated this with their dependence on secretion of thyroid-stimulating hormone (T.S.H.) by the intact pituitary.

Dr. S. H. WOLLMAN (U.S.A.) showed that the ability of individual thyroid tumours to take up iodine could be a measure of their malignancy—although in some instances, paradoxically, the hypersecretion of the tumour completely inhibits T.S.H. production, illustrating the autonomous nature of the particular growth.

Dr. J. FURTH (U.S.A.) described the multiple potentialities of tumour production in the irradiated pituitary and showed how functional neoplasms of different types could be obtained. This approach to carcinogenesis obviously holds out hope of considerable advances in knowledge of the normal interrelations of the endocrine system.

Chemotherapy of Cancer

Dr. C. C. STOCK (U.S.A.) reviewed the problems in setting up an efficient screening programme for thousands of compounds. The ideal of testing every compound against every test system being impracticable, the quick type of microbiological investigation is probably the best preliminary test, followed, in the case of promising materials, by more thorough testing against a range of animal tumours and human tumour implants. This secondary investigation should include tests against a solid tumour, an ascites tumour, and a leukæmia, with human tumours carried by implantation as preferable additional systems. It was generally thought best to err on the side of using test tumours very sensitive to drug action, leaving tests on the spontaneous, and usually more resistant, tumours to later stages of the programme.

Prof. T. YOSHIDA (Japan) emphasised that laboratory tumours rarely metastasised, so that this important facet of neoplasia in man is in danger of being insufficiently attacked. His group have therefore produced strains of ascites tumours, especially hepatomas, where invasion of the blood-stream by tumour cells can be seen as early as twenty-four hours after implantation.

Prof. A. HADDOW (Britain) suggested that prevention by chemotherapy might be easier to attain than outright cure, and he described a series of compounds which, in the laboratory, would totally inhibit the growth of implants of Walker rat carcinoma. Another series of compounds related to the alkylating agents (in the development of which the Chester Beatty Institute have played a large part) were much less toxic to the host than those presently used. But however bright this experimental picture appears, Dr. Haddow's healthy scepticism led him to predict that the future of chemotherapy lay in fundamental studies of the normal and neoplastic cell rather than extension of cytotoxic or cytostatic principles.

Dr. G. MATHÉ (France) discussed the treatment of neoplasms of the hæmatopoietic system with substituted di-ethylene-imine-benzoquinones; and the subsequent discussion ranged from the problems of drug resistance to the question whether in health man has inherent defence mechanisms against malignancy.

Dr. S. FARBER (U.S.A.) gave a comprehensive review of chemotherapeutic agents whose mode of action is that of an antimetabolite, an antibiotic, or an anti-enzyme, with particular emphasis on actinomycins C and D and the anti-folic-acid drugs. After emphasising that tumour retrogression by chemotherapy alone, while uncommon, was not unknown, he suggested that the day would come when every malignant condition would respond to therapy by compounds completely non-toxic to the host, and that even active immunisation against all types of cancer would finally be achieved.

Prof. L. F. LARIONOV (U.S.S.R.) described the experience of some Russian clinics with various types of alkylating agents, and indicated that better effects were to be expected by combining the active alkylating centre through a natural aminoacid to another carrier such as a vitamin or peptide, so lessening host reactions. Of great interest was his evidence that certain types of malignancy, notably Hodgkin's disease, could be cured by alkylating agents alone provided that the dosage was properly controlled, pushed to the limit of the patient's tolerance, and continued by maintenance and, finally, prophylactic therapy.

CHEST DISEASES

THE triennial discussions on tuberculosis in the Commonwealth countries, which the National Association for the Prevention of Tuberculosis has fostered in the past fifteen years, have been steadily broadened both clinically and geographically. This year's conference, held in London on July 1–4, was combined with the annual conference of the British Tuberculosis Association and was attended by delegates from countries and dependencies in all five continents.

Anti-tuberculosis Campaign

Dr. JOHANNES HOLM, chief of the Tuberculosis Section of the World Health Organisation, epitomised his outlook in the declaration: "Tuberculosis is a public-health problem as long as there is a risk of any individual in the community contracting the disease." Prevalence of demonstrably infectious pulmonary tuberculosis varies from a rate of 20 cases per 1000 adults in parts of Africa to 1 per 1000 in Denmark. More than half the children aged 15 years in the Somalilands, Ethiopia, and West Pakistan show evidence of infection. Indian surveys have surprisingly shown that tuberculosis there is as prevalent in village communities as in those of urban areas. Mass vaccination with B.C.G., because it is effective and easy to arrange, is at present more widely applied in the world than is diagnosis and chemotherapy, whose practical application among scattered poor communities presents immense difficulties.

In contrast to current trends in this country, several speakers made a plea for more hospital beds for tuberculosis, and more trained specialist staff, for tropical countries. The dangers of giving isoniazid alone, and the paramount importance of effective chemotherapy were emphasised. Relapses after even long-continued drug treatment was discontinued, and the emergence of resistant bacilli after too little chemotherapy, showed that tuberculosis treatment should still be a specialised enterprise.

Infection in Laboratories

A series of papers described the hazard of tuberculous infection among laboratory workers from sputum containers, culture bottles, and laboratory animals. The recommended prophylactic measures included air hygiene, personal hygiene, technique cleanliness, work supervision, and health supervision especially of junior staff, along with tuberculin tests and B.C.G. vaccination on entry to the service and periodic chest X-ray examination. Although this subject has produced a growing literature only in the past few years, it was in fact mentioned by Robert Willan [1] in his report on the diseases of London for the year 1800, in which he listed "bricklayers' labourers, laboratory men, coalheavers and chimney sweepers" as specially liable to "obstinate pulmonic diseases terminating in consumption".

1. Willan, R. Miscellaneous Works (edited by Ashby Smith); p. 389. London, 1821.

Surgery for Pulmonary Tuberculosis

The place of surgery in treating pulmonary tuberculosis was debated with great vigour round the lessons to be drawn from the report,[2] which we have lately reviewed,[3] of a widespread study of the results of thoracic surgery in the United Kingdom during 1953–54.

It was made clear that a historical study of this kind has only very limited application to current circumstances. The therapeutic compass today is pointing away from surgery in tuberculosis. In 1957–58 in England and Wales 1168 collapse operations and 3380 resections were performed, compared with 4207 collapses and 3923 resections in a similar period four years ago. Nevertheless it was significant to hear a senior hospital physician declare: "I am not convinced now that chemotherapy is so dependable that consideration of surgical intervention is no longer important." Results after tuberculous lung surgery depend on the extent, destructiveness, and drug resistance of the disease, and the age and sex of the patient. Adequate chemotherapy, says the report, is the most important factor in surgical success. Women under 40 with limited unilateral lesions which were drug-sensitive showed the best results. Yet these very critera cannot fail to prompt the query, "Was your operation really necessary?" In surgery of all kinds, the best technical results are achieved in cases where operative interference is least necessary. While the physician is compelled to turn to the surgeon for help with the patient whose cavity persists, excreting resistant bacilli, the surgeon will not welcome a patient on whom he must operate without benefit of effective chemotherapeutic cover. It appears that in such cases modern thoracoplasty gives better results than resection in this country. United States practice is different. There collapse operations are being abandoned in favour of excisional surgery; but according to Dr. J. MAXWELL CHAMBERLAIN (Columbia University) it is American practice to operate most readily on early cases, before chemotherapy has been long established—partly, it appears, because hospital stay is thereby shortened, and because there are pension-computing advantages to ex-Service patients who can show thoracotomy scars.

Radiography

Mass radiography of the "hazard groups" in the community was confirmed as of value in eliminating sources of infection. Household contacts, middle-aged and older men, lodging-house residents, tuberculin-positive adolescents, and unvaccinated immigrants who have been exposed to high infection risks here give the highest yield. There are still many adults in this country who have never been X-rayed.

On possible risks from diagnostic radiography it was reassuring to hear from Dr. J. F. LOUTIT that the chance of serious genetic damage was negligible when well-maintained modern apparatus is used, with strict attention to technique designed to avoid radiation to organs containing germinal epithelium. Frequently repeated exposure to diagnostic radiology *might* produce a summation risk of leukæmia, but even this danger was

2. Francis, R. S., Curwen, M. P. Major Surgery for Pulmonary Tuberculosis. London, 1958.
3. *Lancet*, 1958, i, 1373.

considerably reduced when only part of the body's bone-marrow was exposed to radiation. On the whole it seemed that any very small risk there might be of leukæmia following diagnostic X-ray examination is enormously outweighed by the chances of early X-ray diagnosis of lung disease.

Atmospheric Pollution

Three centuries and more have passed since our King James I's [4] tirade and John Evelyn's [5] lament tried to influence public opinion against the pathological effects of "that hellish and dismall cloud of sea coale . . . so universally mixed with the otherwise wholsome and excellent aer, that her inhabitants breathe nothing but an impure and thick mist . . . corrupting the lungs . . . so that catharrs, phthisicks, coughs and consumptions rage more in this one city than in the whole earth besides".

Much the same sort of complaint was made by Dr. P. J. LAWTHER and others at the conference, when more evidence—chemical, physical, meteorological, and statistical—was adduced to correlate chronic bronchitis and lung cancer with particulate and gaseous pollution of the ambient air and with tobacco pollution of the bronchial mucosa. Lawther defines three grades of atmospheric pollution:

(1) An "acute" form, occurring when smoke is trapped under an immobile cold anticyclone air layer, also labelled "smog". This is an uncommon, freak, climatic event, fraught with fatal danger to old people and cardiorespiratory cripples.

(2) "Subacute pollution," comprising the more frequent episodes of winter fog of short duration which spell exacerbation and relapse for the chronic bronchitic.

(3) "Chronic pollution," Lawther's term for the endemic winter air contamination of English industrial towns. The active principles of this pollution are mainly suspended carbon of various types, tars, and sulphuric-acid particles. These are suspected to be the factors inducing recurrent bronchitis and lung cancer.

This simple classification receives support in the analysis by Gore and Shaddick [6] of increased mortality in London during periods of measured varying atmospheric pollution, and in the second [7] of Reid's Milroy lectures.

Cigarette Smoking

Prof. ALEXANDER KENNEDY explained convincingly that only a sudden, determined, and complete wrench—if necessary by hypnosis—could enable the heavy cigarette smoker to give up his addiction. Attempts at gradual reduction by self-rationing are less likely to succeed. Supporting sympathy and restraint by relatives and friends are necessary.

Tuberculosis and Sarcoidosis

One of the most exciting discussions dealt with the relationship between tuberculosis and sarcoidosis. Dr. J. G. SCADDING cautiously defined sarcoidosis only in terms of its characteristic morbid histology—epithelioid-cell nodules without necrosis or round-cell infiltration and, in chronic lesions, with hyaline deposits. Sarcoidosis could be a phase of tuberculous disease with weak tuberculin allergy. Typical sarcoidosis has been identified in a patient who a few years earlier had tuberculous cervical glands from which human-type bacilli had been recovered. Most cases of sarcoidosis show no response to ordinary antituberculous chemotherapy unless corticosterone is added. In some, frank tuberculosis appears later, and with it is acquired tuberculin sensitivity with subsidence of the sarcoid lesions. During cortisone therapy in sarcoidosis, it is common to witness the emergence of tuberculin sensitivity. Though no bacilli have been demonstrated in sarcoid lesions, mycolic-acid residues characteristic of tubercle-bacillus breakdown products have been identified. On ætiology Dr. Scadding felt compelled to ascribe the majority of cases he has seen in this country to tuberculosis; but he would not exclude other possible causes such as beryllium; and in other countries there may be yet other excitants.

It is interesting to compare this conclusion with one expressed twenty-eight years ago by Sir Archibald Gray,[8] who, in discussing subcutaneous sarcoid, is reported as saying he considered that these lesions represented a group of reactions rather than a specific disease and that some of the lesions might be tuberculous. Interesting in this connection, too, are the lung nodules in Caplan's syndrome—the sharply defined round lesions found in the lungs of rheumatic coalminers; where no evidence of active tuberculosis and no bacilli are found, yet characteristic concentric tidal deposits of macrophages and coal-dust are seen among dense fibrous strands. Here, too, mycolic-acid residues are demonstrable.

An alternative ætiology for sarcoidosis was postulated by Dr. HAROLD L. ISRAEL (Pennsylvania), who defined the condition as "a prototype of granulomatous reaction" increasingly prevalent in the United States, and rarely associated with erythema nodosum. It is more than ten times as common in Negroes (especially young women) as in Whites. The view formerly held in America that sarcoidosis is an atypical tuberculosis has now apparently been abandoned in favour of a notion that it is a specific allergic hypersensitivity reaction to an "inert" substance—possibly pine-tree pollen. In supporting this hypothesis Dr. Israel averred that most American patients with sarcoidosis came from pine-forest areas, and that pine pollen contains lipid and has acid-fast staining properties, and when injected into animals produces granulomas—though not in the lungs.

At the annual dinner of the British Tuberculosis Association on July 3, Dr. OWEN CLARKE, the hon. secretary, said that, whereas formerly the word "tuberculosis" carried a stigma for the patient, today it carries a stigma for the doctor. Many chest physicians are almost ashamed that they handle cases of pulmonary tuberculosis, and seek to emphasise the wide range of other diseases in which they are masters. What a tragedy of perverted thinking! For the duty of a good doctor is to restore his patient to full economic independence and social stability, and there is no branch of medicine in this country which teaches this principle so well as does tuberculosis work. The chest physician is at the head of a team which is closely concerned with the treatment of disease, the social complications which may arise from it, and the public-health problems involved. Does any other consultant really concern himself personally with all these aspects of medicine? On the clinical side, the Association's members have time to expand their work into other branches of chest disease, and their special training and experience makes them well fitted to do so. But let them beware lest in trying to increase their importance they succeed only in diluting their special ability and lose their real understanding of good medicine. Our own specialty, said Dr. Clarke, is surely one of the most fascinating and progressive in medicine, and should continue to demonstrate that the treatment of sick people demands more than an interpretation of scientific jargon and even today is a human art involving the whole structure of the man's securities.

4. A counterblaste to Tobacco. London, 1604.
5. Evelyn, J. Fumifugium. London, 1661.
6. Gore, A. T., Shaddick, C. W. *Brit. J. prev. soc. Med.* 1958, **12**, 104.
7. Reid, D. D. *Lancet*, 1958, *i*, 1289.
8. Gray, A. M. H. *Proc. R. Soc. Med.* August, 1930, p. 1487.

British Medical Association

ANNUAL REPRESENTATIVE MEETING

THIS year's Annual Representative Meeting of the British Medical Association, which ended at Birmingham on Monday, was not one of the liveliest of recent years. The announcement of the rejection of the claim for a further interim increase in remuneration was received with apparent inertia by an audience whose reactions seemed to have been deadened by past experiences.

The Association met under the presidency of Prof. A. P. THOMSON (Birmingham), and the Annual Representative Meeting was held in the great hall of the university at Edgbaston, with Dr. A. BEAUCHAMP (Birmingham) in the chair.

The Duke of Edinburgh had graciously consented to accept nomination for President, and the Association "honoured itself by electing His Royal Highness as President for 1959–60", standing orders being altered for the purpose.

NO INTERIM AWARD

Dr. SOLOMON WAND, chairman of council, told representatives that the Minister of Health had refused a further interim adjustment which had been requested because the Royal Commission on Doctors' and Dentists' Remuneration had not reported by Easter, as had been hoped. An application was made because of the previous Minister of Health's undertaking when the Commission was set up. Dr. Wand and others met Mr. Walker-Smith on June 17. "This letter was placed in my hand yesterday afternoon at 3 o'clock," commented Dr. Wand, holding up the Minister's reply on July 10. The letter recalled that when the medical profession's delegation came to the Ministry there was a 2¾-hour discussion. The Minister then gave, in what he described as "a highly summarised form", the reasons why he was not able to agree to an immediate further adjustment.

"You pointed out that my predecessor had undertaken that a claim could be considered if the Royal Commission had not reported by Easter 1958. (You will, of course, remember that my predecessor's letter of June 6, 1957, in which he gave this undertaking, concluded with the phrase: 'But you will, I know, understand that it is impossible for me to commit myself in any way at this stage, when neither we nor you can have any idea what might happen in the interim or what such a claim might amount to.')

"The reasons why I am unable to agree that the circumstances warrant a further interim increase at the present time are broadly two-fold. In the first place, although the Royal Commission are not yet ready to report, they are pressing ahead with all speed and, assuming that their report is not unduly delayed, a further increase would run the risk of prejudicing their work. Secondly, the economic situation of the country at the present time must be taken into account. Circumstances since April and May, 1957, to date have not changed so greatly as to justify an increase. Moreover, no other people remunerated from the public purse who received a pay increase of 5% in April and May, 1957, have yet received any further award. A further award to the doctors might well lead to claims for increases in remuneration of an inflationary nature from others and it remains just as important as ever to secure stability in wages and salaries.

"It is of course open to the Association to make further representations at any time but what I have said in this letter represents the view I am bound to take at present."

Dr. Wand remarked that it had taken a long time since June 17 to say 'No'. Would an increase prejudice the Royal Commission? A new grade of registrar had been determined unilaterally by the Minister: did that prejudice the Royal Commission any less than an interim adjustment? How did the Minister know that the Royal Commission would be prejudiced by such a change? Dr. Wand had offered to write to the chairman of the Royal Commission to find out whether such an adjustment would prejudice the Commission.

Of the economic situation Dr. Wand declared: "Whenever we go the economic situation is wrong." But in any event what was the relevance of the economic situation? Had any other section of the community received only 5% increase since 1951? As to the Minister's statement that he would be pleased to receive further representations, Dr. Wand said: "We have heard that one before, but we are going back after all." He suggested that the representative body should have time to ponder on this letter and that discussion be deferred until later in the meeting.

After ten years of the National Health Service, Dr. Wand thought that the most important feature was the wonderful service that was being given to the public. The public had had wonderful value for its money. That was due to the devotion, in spite of many frustrations and disappointments, of those engaged in the practice of medicine and associated professions and callings. After ten years doctors could also say that their relationship with Government officers had been good, consistently good. When it came to the realms of higher policy, could the same be said about relations with the Government? (Cries of "no".) Dr. Wand said that he was not only thinking of remuneration when he said that the profession must be alive to the danger of unilateral decision. The unilateral decision, carried on indefinitely, would lead to control.

REVIEWING THE MEDICAL SERVICES

The representative body authorised the council, in consultation with the Royal Colleges, the Scottish Royal Medical Corporations, the College of General Practitioners, and the Society of Medical Officers of Health, to determine the size and the precise composition and terms of reference of the committee to review the medical services, and to appoint the chairman of the committee.

Dr. J. S. ROSS (East Herts) thought that doctors could not have the type of health service they wanted until it was known what form of service the majority of them would support. His motion to this effect was referred to council.

Dr. B. BURNS (Sheffield) was for saying what was known to be true, even if it was unpopular. This revelation turned out to be that the frustration of family doctors arose from two basic causes—the terms of service inseparable from capitation-fee remuneration, and the abuse of the "free" service by certain patients. A relentless minority of patients were cadgers and whiners who trifled with doctors' time and leisure. If patients wanted doctors' time, they must be prepared to have a value placed upon it. They must be prepared to pay for it. The capitation fee brought out the worst in the doctor, and the "free" system brought out the worst in the patient. But Dr. J. S. NOBLE (Morpeth) felt ashamed that the representative body was being asked to blame patients. "Doctors are responsible for running their practices," he said. "Responsible doctors produce respect."

A younger practitioner's view was put by Dr. W. P. LAMBIE (Sheffield). The great majority of young practitioners, often insidiously prompted by those in high office to whom they looked for help and guidance, were clamouring for a full-time salaried service. "We cannot continue as at present and the only real alternative to the capitation-fee remuneration is a fee per item of service." It would wipe out the present frustration and discontents, particularly if patients paid a proportion of the cost of the items at the time.

PARKING PROBLEMS

"It is not impossible that if some solution is not found for doctors' parking problems, people living in the centre of big cities may not be able to obtain a National Health Service practitioner to look after them." Dr. WAND's warning was referred to by Dr. I. M. JONES, chairman of the private practice committee, who said it was quite impossible for a doctor to deal properly with a patient if he was all the time wondering whether his car would be there when he came out or whether he would be apprehended. The Ministry of Health had offered to join a deputation to the Ministry of Transport. Though the Minister of Transport at first refused to see the Association at all, he later agreed to see its representatives immediately after the St. Marylebone parking-meter inquiry report had been issued, and after he had taken his decision on that report. He had, however, indicated that no extension of parking meters would be made until the Marylebone scheme had had a full trial and until after he had had discussions with the Association.

COORDINATION OF THE PROFESSION

Intraprofessional relations and the coordination of the profession, in the light of what was described as "the coming medicopolitical storm", loomed large in the minds of representatives. They approved a resolution, moved by Dr. J. G. M. HAMILTON (Edinburgh), instructing council to consider "as a matter of urgency" specific arrangements necessary to achieve the "pressing need to improve intraprofessional relationships and solidarity".

Introducing the report of the committee on professional coordination, Dr. WAND described coordination as something which proceeded by evolution rather than by edict and dictate. "We are a democratic institution in a profession where there are many democratic institutions. A year ago there were dark clouds in the sky so far as medical unity was concerned. It is my belief that those clouds are dispersing." He referred particularly to the setting-up of the review committee.

A motion from Lincoln welcomed any action which would promote unity on matters affecting the general welfare of the profession. Dr. A. M. MAIDEN explained that it was intended that every avenue of approach to the non-politically-minded practitioner in the periphery should be explored.

Mr. A. LAWRENCE ABEL (Marylebone) said it was clear that some action must be taken by the Association to promote unity. "Those of us who are not perhaps quite anæsthetised by the Royal Commission will wake up to the fact that we must have every member of the profession in contact with every other," he declared. Here was a great chance for the Association to carry out rehabilitation, to make sure that those young men aged 65 who had retired from the service on July 5 were allowed to wear out and not to rust out. "I have estimated that if 20 of these young men were employed and provided with a morning coat and top hat, and given travelling expenses, they could visit every doctor in the country who does not attend a B.M.A. meeting—and that is quite a fair proportion." Dr. WAND invited any doctor to write to the secretary with positive suggestions.

TELEVISION PROGRAMMES

Dr. G. S. R. LITTLE (Greenwich and Deptford) declared: "I do not think we did good by suggesting that the *Your Life in Their Hands* programmes were a cheap form of entertainment. In the main, as many of you must know, they were very good and they did not produce any adverse reactions. At least we did not have evidence that they did." He warned the meeting that the public were apt to look on the profession with disfavour "when we batten down and blow cold over things of this nature".

Dr. WAND owned that "we may have to review our ethical approach to these developments, which are bound to take place and are taking place in other parts of the world, particularly in the North Americas".

Dr. DORIS ODLUM (Bournemouth) felt strongly that the new medium was a tremendous power for good or evil. It quite obviously appealed to the public as a means of education and a source of information. There should be such an active relationship with the B.B.C. that the Association could go to them and say they thought a particular programme would be of great value. "I hope that we shall not be so conservative as to give the impression that we are hostile or trying to put back the clock."

Harrow withdrew a motion calling on the B.B.C. to consult with the B.M.A. before televising or broadcasting programmes "which are liable artificially to increase the work of doctors and cause anxiety in the population at large".

CANCER EDUCATION

East Yorkshire asked the representative body to deplore the use of television for the purposes of cancer education. Dr. K. W. BEETHAM said the small number of active cancer educators concentrated on the 30% of neoplasms, that could be cured and ignored the lethal neoplasms which were 70%: this was not education. "If we are not in a position to tell all the facts, then quite clearly our profession should not tell any of the facts," Dr. Beetham declared. Now 8 million people had had thirty minutes' intensive cancer education from the Christie Hospital, Manchester. Some thousands, perhaps hundreds of thousands, might for some time have a mild cancer phobia and some might be more permanently affected.

Dr. G. CORMACK (Newcastle upon Tyne), however, had no doubt that education, by and large, was a good thing. Why should one oppose the public education of the people on a matter of extreme importance to health? Family doctors were always deploring the late arrival of patients with cancers which could be cured. He suggested that the B.B.C. and Independent Television contractors should not only educate about cancer, but discourage cancer neurosis at the same time. The East Yorkshire motion was defeated.

SPENS: A CASE FOR THE SCOTTISH COURTS?

The contractual validity of the Spens reports may after all be tested in the law-courts. Dr. WAND recalled that a resolution of the Conference of Local Medical Committees

in June last year caused the council of the Association to explore the possible difference between Scots and English law in relation to this. The opinion of Scottish counsel had been taken. "The Association has been advised that in Scotland there exists a procedure known as a 'special case' which is particularly apt to raise the question which we wish to have decided by the courts. It differs from the usual type of contentious litigation in that the parties amicably agree to present their differing views of the position to the Court for objective decision."

In order to raise a special case it was necessary, in the first place, to have the consent of the Secretary of State for Scotland, as the Minister responsible for the National Health Service in that country; thereafter it was necessary for the Association and the Secretary of State to agree upon a statement of facts and a question or questions of law to be submitted to the court. "Both the statement of facts and the questions of law we propose will be so framed as to ask the court to determine whether our view or that of the Government regarding the obligations implicit in the acceptance of the Spens report and the Danckwerts adjudication is correct."

The Minister of Health and the chairman of the Royal Commission had been informed of the Association's decision to seek the agreement of the Secretary of State to the presentation of a case, and the matter had been laid before the Secretary of State.

ANONYMITY

Dr. C. P. WALLACE (Guildford) said the Association still intimidated and prevented learned members of the profession from giving information to the public. "I can see nothing unethical, immoral, or improper if Mr. Lawrence Abel—so well known and highly respected in the representative body—were to address the public on cancer," he continued, "yet, according to the ethical rules of the Association, that would be out of order."

The new chairman of the central ethical committee, Dr. S. NOY SCOTT, announced that the committee at its next meeting was, at his request, to reconsider anonymity on television.

HOSPITAL STAFFING

Mr. T. HOLMES SELLORS, chairman of the Central Consultants and Specialists Committee, told the meeting of an estimate that there were between 100 and 110 senior registrars in each of the specialties of general medicine and general surgery who, being time-expired, now constituted a group of people who could not be employed although fully equipped in nearly every case for consultant work. The Ministry had persistently refused to accept the principle, laid down in the Strachan report, that there should be a review to decide whether hospitals were adequately staffed. Instead the Minister had imposed his own attempted solution—the creation of a special type of post to be determined by the regional hospital boards where they felt there was a vacancy for a man doing such advanced work and who could not find a suitable appointment in it. "The Central Consultants and Specialists Committee and the Joint Committee have rejected that idea completely as being mere stalling for political expediency," declared Mr. Holmes Sellors. "The only suggestion of the Ministry which has been accepted as providing a loophole to continue negotiations is the formation of a working party which has as its terms of reference 'to study the whole of hospital staffing'."

The management side of Whitley Committee B had agreed to consider cases of S.H.M.O.s doing consultant work. Over 10,000 letters had been sent to S.H.M.O.s; nearly 1000 replies had been received, of which 500 had been selected as suitable cases to place before the management side for discussion. "There is, however, the disconcerting feature that it appears the management side had no idea that the problem was so extensive, and they have quickly reverted to their original terms—that they would look at such cases and see what the nature and size of the problem was, but would not commit themselves any further as to what they would do with them."

Dr. C. VIPONT BROWN (Manchester) spoke of an aspect of the problem of hospital staffing which was of particular concern to general practitioners. Outpatient departments should be regarded as consultative clinics, but in many cases the patients were not seen by consultants. The fact that other members of hospital staffs were doing work of consultant status emphasised the need for the creation of more consultant posts.

Dr. N. K. SHINTON (Birmingham) proposed a motion deploring the decision of the Minister of Health to create designated senior registrar posts before the recommendation of the working party had been made.

Mr. H. H. LANGSTON (Winchester) asked whether the junior hospital staffs group council would be prepared to advise members in no circumstances to apply for these posts. Mr. R. BREARLEY, chairman of the group council, said that he would be prepared to advise such a course of action, and he believed his executive committee would endorse it. Mr. LAWRENCE ABEL moved an addendum instructing council to refuse advertisements for these posts. This was accepted as a reference to council, and the original motion was carried.

Also carried was a motion from Birmingham urging speedy action "so that S.H.M.O.s whose level of work and responsibility in their present post can be shown to be of consultant standard may be paid as consultants".

DISTINCTION AWARDS

Dr. WALLACE, advocating the publication of merit awards, thought that the council seemed unaware that the present method of distinction awards was unacceptable to the profession and contrary to public policy, and he did not feel that the Central Consultants and Specialists Committee could approach the matter with that lack of bias which it demanded. On the other hand Scotland, according to Dr. A. SMITH (Lanarkshire), was well satisfied that the system operated satisfactorily and that publicity would be very wrong.

Dr. H. GLYN JONES (Bromley) thought that if there were within the State service people of such ability that they merited very special awards, they should be known to general practitioners, the people who would refer cases to those consultants.

Dr. J. C. KNOX (Tyneside) claimed that the Central Consultants and Specialists Committee did not know what the consultants wanted. The consultants in his region felt quite as strongly as the general practitioners about this secrecy. His division believed that when the profession had been hesitating whether to enter the Health Service in 1948, information had been divulged by the Minister about who would be getting the merit awards and that had influenced the committee to lead the profession into the service. Mr. J. R. NICHOLSON-LAILEY (West Somerset) said it would be grossly unfair to pillory the consultant who had not a merit award. The general

practitioner knew far better than any merit-award committee who was a good consultant.

The debate was cut short by a motion to put the question. Mr. HOLMES SELLORS said it was early realised that publication was absolutely impracticable, and he pointed out that consultants in the periphery were able to express their views. Dr. WALLACE held that it was impossible to imagine that it was in the public interest that public money should be dispensed at the instance of a secret committee to secret people. He suggested that a secret ballot of consultants and specialists would overwhelmingly throw out the system.

After a count, the meeting supported Dr. Wallace by 96 votes to 91.

NATIONAL MAJOR CASUALTIES SERVICE

Mid-Cheshire asked the meeting to state that it was "not satisfied with the complacency of the council regarding the national major casualties services." Dr. W. N. LEAK said: "Much has been done in recent years to organise rescue work, but apart from the Didcot disaster, where affairs were chaotic, all have occurred in well-populated areas, where help and hospital were readily available. It would, I fear, be very different if a disaster occurred—as it inevitably will in time—in a rural area far from hospital help. In such conditions careful planning beforehand may save many lives, but of this planning general practitioners had so far have no indication."

Dr. R. SMITH (S. Middlesex) drew attention to the fact that near London airport were the homes of half a million people, who were exposed to the constant menace of disaster from the air. The regional hospital board had a plan, but applied to the London airport area it ignored the fact that on the spot in this densely populated area there was already a mobile force of general practitioners—not one of whom would know where to start if he found himself suddenly near the scene of an air disaster. The population at risk increased steadily with the development of new housing estates.

Dr. R. L. MEYRICK (Lewisham) opposed Mid-Cheshire's view. "We had a major disaster last year," he said, "and the arrangements worked with complete satisfaction." The Mid-Cheshire amendment was lost.

CONSULTANTS IN TRAINING AND GENERAL PRACTICE

Arrangements for hospital junior medical staff to obtain experience in general practice during their hospital employment should be left to the individual hospital, Marylebone considered. Dr. E. C. WARNER remarked that it was not only the consultant in training who should have experience in general practice but anybody who would play a part in the medical life in this country.

Dr. R. M. S. MCCONAGHEY (Torquay) thought there was nothing better for harmony in the profession than that each person should have a spell of doing the work of the others.

Dr. G. S. R. LITTLE (Greenwich and Deptford) did not think it should be left to the individual. He was going to specialise; he did not then realise the value of experience in general practice.

The Marylebone motion was carried.

DEFICIENCIES OF HOSPITAL BUILDINGS

Dr. H. G. H. RICHARDS proposed a motion, which was adopted, instructing council to press the Ministry to allocate substantially greater sums to capital development in relation to hospital services. "Hospital building in the non-teaching institutions remains the Cinderella of the public service," he complained. Out-of-date buildings made for excessive staffs of all types.

Dr. H. SCOTT-KERR (Gloucester) recalled that when the National Health Service started the Government of the day promised a full medical service. With waiting-lists of three months to two years, the public had been hoodwinked.

This point was elaborated by Dr. E. A. GERRARD (Manchester), who said: "The position represents nothing less than a public scandal." 4 people were waiting for every teaching-hospital bed in London and 5 for every such bed in the provinces. In gynæcology 9 patients were waiting for every bed. "In the Middlesex Hospital there are 16 women waiting per bed; in Cardiff 19, in Cambridge 21, and in St. Mary's Hospital, Manchester, no less than 26. For a pelvic-floor repair they have to wait from three to four years to come in; at the Middlesex it is two years, in Cardiff three, and in Cambridge three and a half. We have had new offices and flats, and particularly new Government offices, and new schools. We are of course desperately short of money in this Welfare State, but even so is it fair that little Johnny should attend a diamond-studded school and his mother have to wait three to four years to have her prolapse repair? In my view it is absolutely crazy."

CENTRAL POOL

Dr. A. B. DAVIES, chairman of the General Medical Services Committee, made a statement about the final settlement ("I really mean supplementary payment, because there is no such thing as a final settlement until our claim has been met," he remarked). For 1956–57 the final settlement was £4,600,000. One reason why it was less than in the previous year was inflation of lists; for the first time total numbers were greater than the total population. In addition doctors had received a greater amount of money direct from Government sources. Nevertheless, when the total figure was added together, in the past year general practitioners had received the highest total sum on record. The timing of the payment had been improved from December in 1956 to June in this year.

Bristol demanded a change in the working of the central pool, "which is proving to be unjust and discouraging in its effects." Dr. A. G. HERON described it as a system of merit penalties; general practitioners as a whole could not earn any more, however hard they worked or however much extra work they took on.

Dr. WAND said that if one had a pool which allowed for an average income for every practitioner, as laid down in Spens, and if, as the Danckwerts award provided, every practitioner coming into the service provided extra money to be divided, then one could not have it both ways. On the question of vaccination, he had not heard a speaker point out that general practitioners might have less work to do as a result of such vaccination. "With all its faults—and no system is perfect—the pool system has done us well," declared Dr. Wand.

Bristol's motion was lost.

REJECTION OF FURTHER INTERIM AWARD

In a reference to the refusal of the Minister of Health to grant a further interim increase since the Royal Commission had not reported, Dr. A. M. READ (Portsmouth)

commented: "We have long since discovered that a gentleman's agreement with a politician is a contradiction in terms." (Applause.) Dr. R. P. HENDRY (Rugby) remarked that the profession's claim had been given top-priority procrastination treatment.

The question was put "That this meeting wholeheartedly supports the council in making continued efforts to secure a further interim increase in remuneration." Dr. A. TALBOT ROGERS, deputy chairman: "That is passed without a single opposing vote."

SCHEMES FOR WITHDRAWAL

Dr. DAVIES announced that a special subcommittee had been appointed to deal with the matter of schemes for withdrawal from the National Health Service, and an impartial non-medical expert of the highest eminence had been engaged. It was hoped to report in good time before the Royal Commission reported.

GENERAL-PRACTITIONER BEDS

The meeting passed a motion on the need for more general-practitioner obstetric and medical beds, after rejecting an amendment to delete the reference to medical beds. Dr. F. S. CATTO (Manchester) attacked Lord Moran's House of Lords suggestion that access should be restricted to certain general practitioners. "I believe that every general practitioner ought to have access to these beds," he said. "If not, who is to select the general practitioners?"

PERSECUTION OF DOCTORS

The meeting was told about persecution of doctors in Cuba. Dr. R. L. LUFFINGHAM (East Yorkshire) said that what the Cuban delegation had described to the World Medical Association had been confirmed. Doctors in Cuba had been imprisoned for treating patients with views against the dictatorship, some had been beaten for refusing to disclose information, and armed police were placed outside doctors' surgeries. President Baptista had not replied to a request from the World Medical Association to send independent observers. The representative body carried an amendment making clear that it accepted the facts reported.

MEDICAL WAR CRIMINALS

Dr. ERIC TOWNSEND (Cornwall) moved:

"That this representative body expresses its deep distress on learning that the Federal German medical authorities have seen fit to permit the reinstatement of a practitioner guilty of medical war crimes. It instructs council to take whatever steps seem practical and effective to bring the views of the British Medical Association to the notice of those responsible for this cynical affront to the honour and high ideals of the true practice of medicine throughout the world."

Dr. Townsend said that Dr. Herta Oberheuser, a young fanatical Nazi doctor who volunteered to go to the notorious Ravensburg concentration camp, selected women for experiments by inflicting wounds and then deliberately infecting and neglecting these wounds. She admitted that many of her patients died as a result of these experiments. In 1947 she was sentenced to twenty years' imprisonment. Her sentence was reduced in 1951 to ten years. In 1952 she was released. She had gone into practice near Hamburg.

She was not alone. Hans Eisele, from Buchenwald, was also again in practice. Hans Bodo Gorgass, who in experiments on euthanasia killed thousands of victims in mental hospitals and who was sentenced to death but reprieved, was also in practice.

Dr. I. H. MILNER (City) recalled that 23 S.S. physicians and scientists appeared before the U.S. Military Tribunal No. 1 in Nuremberg. They included Karl Gebhardt, head of the German Red Cross, and Herta Oberheuser. 15 were found guilty; 7 were sentenced to death, 5 to life imprisonment, and Herta Oberheuser, the only woman, was sentenced to twenty years' imprisonment. She had been "rehabilitated" and given a position of responsibility. She admitted having herself administered injections of petrol to patients. "Allowing this physician to practise places us in an invidious position in regard to members of the medical profession in Germany," declared Dr. Milner.

Dr. I. D. GRANT, chairman of the international relations committee, said that the committee had written to the Bundesärztekammer, and he read the reply it had received:

"We German doctors deplore the fact that we have not the legal right in the Oberheuser case to withdraw permission to practise. The Federal Chamber of Doctors has taken every step within the ambit of the law to prevent the practice of medicine by Dr. Oberheuser." The Ministry of the Interior of Schleswig-Holstein had now instituted proceedings for the withdrawal of the approbation, and the German medical profession hoped that the withdrawal of the approbation would be pronounced and that the right to practise medicine would be taken away from Dr. Oberheuser.

Dr. Grant added: "Like everyone we are filled with horror that this woman should have been restored to the practice of medicine in Germany or anywhere else."

Dr. Townsend asked permission to delete the words "Federal" and "medical" from the resolution. As amended the resolution was carried without dissent.

INDUSTRIAL COURT AWARD

Dr. J. B. TILLEY, chairman of the public-health committee, referred to the judgment of the Industrial Court that public-health doctors should be considered as part of the local-government hierarchy, and their salaries should not be considered in isolation, and that this was without prejudice to any claim that might be made by public-health doctors after the claims of all other local-authority officers had been settled. "It is most unsatisfactory that the Industrial Court should have made a pronouncement of this kind on a matter on which they were not asked to give any opinion," he said. The possibility of the Whitley machinery breaking down was very real.

FULL-TIME SERVICE SOMETIMES?

Dr. A. J. MACLEOD (Outer Isles) wanted an addition to the motion from Harrow, moved by Dr. J. B. WRATHALL ROWE, that the meeting was strongly opposed to a whole-time salaried National Health Service, making it clear that this was "for general practice as a whole, without prejudice to what may be for the best in limited areas". The CHAIRMAN did not ask for a vote on either motion or amendment. "I put it that we reaffirm our policy," he said. The meeting agreed.

PRESCRIBING IN GENERAL PRACTICE

Despite assurances from Dr. DAVIES, several spoke in favour of a motion by City that the council should inquire into the whole question of freedom of prescribing in general practice. Dr. ALAN REZLER said that every year hundreds of warning letters were sent to doctors; about

700 doctors were seen by regional medical officers; and a few were fined, some heavily. "We wonder how many patients are sent to hospital solely to save the costs of prescription," he remarked. "I suggest that the present freedom to prescribe is freedom to enter the field 'but beware of the bull'."

Dr. B. BURNS (Sheffield) declared that the much-vaunted freedom for prescribing was illusory. In hospital even the most junior doctor, unlike the general practitioner, had carte blanche. But Dr. J. S. M. ORD (Glasgow) opposing the motion, which was lost, thought younger men must be guided.

TRANSFER OF PATIENTS

A motion that restrictions on the transfer of patients should be abolished was defeated. Dr. GOLIN RUSS (City) moved it. Arguments in favour of the motion were that restriction encouraged complaints, and that the National Health Service patient should not have to ask permission, any more than a private patient had to.

"MERIT AWARDS" IN GENERAL PRACTICE

Dr. WAND appealed to the representative body to give guidance as to whether it wished a system of "merit awards" for general practice to be considered. He explained that the Association had been asked by the Royal Commission to give consideration to some kind of incentive award.

To obtain an expression of views, Dr. R. M. S. MCCONAGHEY moved: "That this meeting sees no objection to a 'merit award' system for general practice, providing a practicable scheme can be devised and subsequently approved by the representative body." An attempt to make this motion read that there was no objection to "an alternative method of remuneration" was greeted with cries of "No," and by a large majority the motion was approved.

ELECTION OF G.M.C. MEMBERS

Approval was given to the new method of selecting the Association's candidates for election as elected members of the General Medical Council. The recommendation provides that a "postcard whip" sent to all doctors shall contain the names of every candidate seeking election, but with the names of those supported by the Association printed in heavy type.

A.I.D.

In the last two hours of an extended final session there was a long and rather emotional debate on artificial insemination by donor, a matter on which the platform appealed for guidance from the meeting.

Dr. L. S. KEENAN (Harrow) condemned any form of artificial insemination as unnatural. Dr. F. W. BELAM (Guildford) was opposed to artificial insemination by donor but not by husband. Said Dr. K. M. TOMLINSON (Gloucestershire): "To help one unhappy woman does not justify our help in the introduction of an almost certainly unhappy child." But Dr. A. BARKER (council) knew there had been a great deal of happiness in the right cases.

Eventually the representative body resolved, while making no pronouncement on the non-medical aspects of A.I.D., to authorise the council to submit evidence to the Government committee on this subject, from the medical point of view, if so desired. But it had already voted 101 in favour to 84 against an amendment by Dr. C. P. WALLACE (Guildford), expressing "grave concern at the increasing practice of A.I.D."

Special Articles

AN EVALUATION OF TREATMENT OF DEPRESSIVE ILLNESS IN A DAY HOSPITAL *

MICHAEL CRAFT
M.D. Lond., M.R.C.P.E., D.P.M.

LATE REGISTRAR, BETHLEM ROYAL AND MAUDSLEY DAY HOSPITALS; DEPUTY SUPERINTENDENT, ROYAL WESTERN COUNTIES HOSPITAL, STARCROSS, DEVON

DAY-HOSPITAL treatment in psychiatry was first described by Dzaghagarova (1937) and Dzaghagarova and Balabanova (1944) in Russia and by Cameron (1947) in North America. These and subsequent articles have emphasised its cheapness and suitability for those of the mentally ill who are well enough to travel and spend nights at home.

It has been suggested that day hospitals, by intensive treatment, may diminish the duration of such treatment in mental illness (World Health Organisation 1953). Be that as it may, it seemed desirable to compare the results of day-hospital treatment with those of conventional hospital care. To this end three studies of Maudsley Hospital records were made. Since depressive conditions form the bulk of those treated, it was decided to concentrate on them.

The working of the Maudsley Day Hospital has already been described (Harris 1957). It admits only those who, but for the day hospital, would have needed inpatient admission.

First Study

The first study concerned patients with depressive states who had had previous attacks of depression, for which they had been treated as inpatients. In three years of Maudsley day-hospital practice 57 such patients were found. In 5, however, the inpatient treatment had been recent—within twelve months—and it was thought that the two periods of treatment might have been for the same illness which had incompletely remitted. 8 patients had had both day-hospital and inpatient treatment for the same attack, and in 3 further cases either information was inadequate or the illness was not depressive. These 16 patients were excluded.

In the remaining 41 patients the duration of day-hospital treatment was longer in 11 and shorter in 30 than the duration of mental-hospital treatment of their previous depressive illnesses. The average for the 41 inpatient periods was 106·7 days, and that for the 41 day-patient periods 68·0 days. The difference between these averages is similar to that obtained in another series discussed below and is explainable in almost identical terms. In each case it was the earlier depressive episode which was treated on conventional inpatient lines. Also the earlier attack may have been more severe. There is conflicting evidence in the literature about the extent to which these factors would cause bias in the results.

Second Study

The second study was based on female patients with depressive illnesses who completed treatment under the same physician as either inpatients or day patients in the three years ended May 4, 1956. The diagnoses were

* Abridged from thesis accepted by London University for the degree of M.D. The first part of this thesis is to appear in the *American Journal of Psychiatry*.

neurotic depression, depressive phase of manic-depressive psychoses, involutional melancholia, and puerperal depression. Patients staying less than a week, those treated as both day patients and inpatients, and those receiving additional diagnoses of personality disorder, organic cerebral illness, or brain damage were excluded. Detailed notes of the initial outpatient attendance and other examinations on admission were available, and these were used to assess the depth of depression on admission on the following four-point scale:

Grade	*Retardation*	*Somatic disturbance*	*Registrar's comment*
(1) Mild	Nil	Minimal or none	Need for admission doubted
(2) Non-psychotic	Moderate	Poor sleep, early waking, some anorexia	Standard admission
(3) Psychotic	Severe	Severe insomnia, early morning depression, loss of weight	Seriously ill patient
(4) Stuporose	Mute	Stupor	Bed patient

For a retrospective series, previous rating-scales proved difficult to apply (Rowell 1951, Cohen et al. 1944, Lorr et al. 1951, Meyer 1951, Malamud and Sands 1947). The four-point scale worked well in the circumstances. Groups of day patients and inpatients with illnesses of similar severity were then compared as regards the time taken for recovery. 64 day patients and 69 inpatients, with depressions of similar severity on admission, were stated at discharge to be " recovered ". 49 of the former and 38 of the latter were discharged within three months of admission, and it can be shown by χ^2 that this is a significantly greater number of day patients than inpatients where $0{\cdot}02 > P > 0{\cdot}01$. Day care is here again shorter than inpatient care.

Third Study

For the third study it was decided to form matched pairs of female depressives, each including one day-hospital patient and one inpatient. 43 pairs were matched for age, previous mental-hospital admissions, severity of illness by the four-point scale on admission, marital status and social class. The characteristics to be matched were decided on after perusal of twelve authors which proved the most helpful in assessing prognostic factors (Bond 1954, Dedichen 1946, Harris and Lubin 1952, Karagulla 1950, Lewis 1936, 1938, 1944, Lundquist 1945, Malzberg 1929, 1935, 1940, 1954, Ødegaard 1954, Pollock 1925, 1931, Rennie 1942, Robins 1954).

As an additional check regarding the depth of depression, the physician who had had charge of the patients was asked to rate the 43 pairs of notes according to the scale of severity. By χ^2 there was no significant difference ($0{\cdot}5 < P < 0{\cdot}3$) between his results and mine.

It was not possible to match for duration of illness before admission. 27 day patients and 31 inpatients had symptoms for less than six months before admission. Using χ^2 this was not significant at the 5% level. 25 day patients and 22 inpatients received electroconvulsion therapy, this difference also not being significant.

The results of treatment for the series were assessed by three criteria—length of stay in hospital, degree of recovery on discharge, and condition five months after discharge. The average duration of treatment of the day patients, together with their standard error, was $73{\cdot}0 \pm 7{\cdot}2$ days, and of the inpatients $101{\cdot}6 \pm 12{\cdot}3$ days. A direct comparison of these averages by the t test shows that P is just 5%. The statistician analysing the results felt that this figure was not significant, because the 5% level was only just attained and the spreads of the distribution being compared were most significantly different ($P < 0{\cdot}001$), the t test being of doubtful validity in these circumstances.

The difference in the scatter of the results was almost entirely due to three high values for the inpatients. If these three values are deleted (and it is dangerous to discard observations unless there are strong external reasons for so doing), the remaining 40 inpatients give an average of $84{\cdot}7 \pm 8{\cdot}3$ days. The comparison of this result with the 43 day patients, allowing for the different numbers, gave a value of P between 0·25 and 0·30. This is not significant.

Similar statistical arguments apply to the figures given in the first study for a different group of patients. Though the significance of the apparently shorter stay of the day patients is therefore doubtful, it is quite clear that day treatment does not take longer than inpatient treatment.

Degree of recovery with the matched series showed 26 day patients recovered at discharge compared with 28 inpatients, 14 day patients and 14 inpatients improved, and 3 day patients and 1 inpatient unchanged or worse. By χ^2 P lies between 0·8 and 0·7. This is not significant.

A follow-up was undertaken by personal interview five months after discharge and was successful with 41 day patients and 41 inpatients, 95% of the total. Within the five months 2 day patients and 4 inpatients had needed readmission to hospital. This difference is not significant. At the end of five months 30 day patients and 31 inpatients had returned to their previous output of work, whereas 11 day patients and 10 inpatients had reduced output. This also is not significant. Clinical rating-scales showed that at five months 23 day patients and 27 inpatients maintained recovery, 9 day patients and 7 inpatients remained improved, and 7 day patients and 6 inpatients were unimproved. Information was inadequate for 7 patients. By χ^2 P lies between 0·7 and 0·5, and there is no significant difference.

Comment

These retrospective studies can be criticised on the ground that the day hospital is most suited to manage the milder depressive illnesses and there would be a strong tendency for admitting physicians to forward the less seriously ill for treatment. One might infer from this view that the milder illnesses would more rapidly recover. Only a trial with initial random allocation of patients would completely satisfy this criticism. It was to deal with this point that the rating-scale and the matched series were set up and an independent assessment was made of the severity of illness. It is felt that, so far as was possible, cases of equal severity were compared. In this context, however, it is worth noting that important studies by Rennie (1942) and Lundquist (1945) doubt whether there is a significant relation between depth of depression and duration of stay or outcome.

Summary and Conclusions

Three studies of Maudsley records are presented which indicate that many depressive illnesses were as effectively treated in the Maudsley day hospital as in the wards, judged by length of stay in hospital, degree of recovery on discharge, and a five-month follow-up. There is evidence that treatment in the day hospital shortens the length of stay in hospital.

I am indebted to Prof. Aubrey Lewis for his encouragement; to Dr. Arthur Harris for his help and permission to use the clinical material of the Bethlem and Maudsley Day Hospitals; and to Mr.

Frank Downton and the late Dr. Vera Norris of Leicester and London Universities for their statistical advice.

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LEPROSY RESEARCH FUND

THIS Fund, which is sponsored by the American Leprosy Missions, was founded in 1953 with the aim of linking leprosy to general medicine and to fundamental research and so attracting more workers to this important but neglected specialty. To administer the Fund, but not to raise funds, a committee was set up in England, of which Dr. W. A. R. Thomson is chairman and Dr. R. G. Cochrane secretary.

The Fund has not the money to finance large projects or research schemes, and its limited resources have been used to stimulate pilot research projects to test whether a particular problem is of sufficient importance to warrant asking for the backing of one of the large Foundations. The Fund is in touch with many institutions all over the world, and also arranges small clinical trials of new drugs to collect preliminary data before comprehensive trials are launched.

Projects which the Fund has backed during the past five years include the following:

Dr. Graham Weddell, with a grant from the Fund, visited India in 1954 to investigate the possibility of using leprosy as a tool in the research of cutaneous sensibility. As a direct result of his work, Dr. David Jamison was appointed, in 1957, to a research fellowship sponsored by the Royal Society, to undertake more detailed research in the histopathology of leprosy, with particular reference to cutaneous sensibility.

In 1955 the Fund raised the money for Dr. E. M. Brieger of the Strangeways Laboratories, Cambridge, to visit the African Inland Mission Hospital at Oicha in the Belgian Congo to investigate the possibility of using electron microscopy in the study of the life history of the *Mycobacterium leprae*. The value of this investigation is shown by the fact that the Colonial Medical Research Council has now given a grant for Dr. Brieger's work.

The Fund proposes to organise a reference laboratory and a registry of histopathology which will ultimately contain complete clinical, photographic, and histological records of types and groups of leprosy in the different parts of the world. The cost of organising this unit will be about £2300 a year.

The address of the Leprosy Research Fund is 11A, Weymouth Street, London, W.1.

"... Honest compassion has no coefficient in the world of statistics—at least up to now. An unreliable guide to policy on its own, it nevertheless has the loudest voice and draws the warmest cheers. I suppose the majority of young parents would prefer that a million mentally disordered people were permanently 'locked up' than that harm should befall their children. The development of civilised society has always depended on the extent to which considerations of that kind can be subordinated to the common good."—C. H. ROLPH, *New Statesman*, July 5, 1958, p. 6.

Public Health

OCCUPATIONAL HAZARDS IN THE BONE-MEAL INDUSTRY

ROBERT LAMB
T.D., B.Sc., M.D. Glasg., D.P.H.
PHYSICIAN, GATESIDE INFECTIOUS-DISEASE HOSPITAL, GREENOCK

BONE fertiliser is a well-known source of anthrax infection in animals and occasionally in man. In Greenock there is a factory which produces animal charcoal for use in sugar refining. This factory imports bones from India, Pakistan, and the Argentine. As delivered these bones have already been broken up into fragments varying in size from 2–3 in. long to granules about $^1/_4$ in. in diameter. The raw bones are further broken up in crushing mills, and thereafter the crushed material is passed over moving metal screens which sort it into three grades of granularity before it is reduced to charcoal in the ovens.

The very fine bone dust remaining at the crushing mills is collected and sold as bone fertiliser. Precautions against inhalation of this fine dust include the provision of face masks for the workers and the use of exhaust fans erected over the crushing-plant. The workers wear protective clothing, but the fine dust penetrates through this clothing and reaches the underclothing. Bone dust is to be found everywhere in this factory, even in the offices.

This description of the heavy concentration of bone dust is important, because frequent sampling of the raw bones, the crushed bones, and the bone dust has shown that the spores of virulent anthrax bacilli are present. Such sampling has only been carried out over the past five years, during which cases of cutaneous anthrax have occurred among the workers. An official of this firm assures me that the source of supply of bones has been the same in the past twenty-eight years. Further, the only cases of cutaneous anthrax he has knowledge of are the four described here.

Apart from cutaneous anthrax I have encountered two cases of empyema in workers in this factory. In both cases the infecting organisms were of the clostridial group. These patients were employed at the crushing mills and were therefore exposed to heavy concentrations of bone dust.

Cutaneous Anthrax

Table I shows the age, sex, and occupation of the four patients with cutaneous anthrax.

TABLE I—DATA ON FOUR CASES OF CUTANEOUS ANTHRAX

Case no.	Sex	Age (yr.)	Occupation	Site	Date admitted
1	M	29	Labourer	Side of neck	Dec., 1955
2	M	47	Lorry driver	Back	April, 1956
3	F	53	Sack repairer	Over rt breast	Nov. 1957
4	M	29	Process worker	Rt malar eminence	March, 1958

Case 1.—This man, aged 29, was admitted forty-eight hours after a painless red papule had appeared on the left side of his neck. He was a labourer employed in carrying sacks of raw bone fragments to the crushing mill; he stated that he carried these sacks over his left shoulder. It was likely then that either he had an abrasion on the left side of his neck or an abrasion was produced by a spicule of bone protruding through a sack.

On examination the sore had a black necrotic centre about ½ in. in diameter. There was much swelling of the tissues around this sore and regional adenitis. Smears of serous exudate taken from this sore were positive for *Bacillus anthracis*. The patient was afebrile and non-toxic.

Treatment and progress.—Phenoxymethylpenicillin 125 mg. was administered six-hourly. The lesion enlarged for two days, reaching a maximum size of 2 in. × ½ in.; around the necrotic centre a ring of vesicles appeared. After three days the lesion began to regress. The patient was discharged after fifteen days. He was seen after twenty-eight days as an outpatient when the sore was granulating, but it was obvious that a scar would result.

Case 2 was a lorry driver, aged 47, who delivered sacks of bone meal from the factory, loading the sacks on to his back from the tailboard of the lorry. He was admitted with a forty-eight hour history of pain and swelling over the left side of his back. On the day of admission he felt nauseated and shivery and had to go to bed.

On admission he looked very toxic, and his blood-pressure was 80/50 mm. Hg; temperature 104 F. The sore consisted of a black necrotic centre about ½ in. in diameter, and there was much lardaceous œdema surrounding it for a radius of 8–10 in., with gross hæmorrhagic infiltration into this œdematous zone. The sore spread for seven days and the hæmorrhagic infiltration became more extensive.

Treatment and progress.—Phenoxymethylpenicillin 250 mg was administered six-hourly. After three days the patient became afebrile and his general condition was much improved. He was discharged after twenty-eight days with a deep ulcer where the eschar had separated.

Case 3 was a woman, aged 53, employed as a sack repairer; before the sacks were submitted to her for mending they had been cleaned by vacuum suction. Five days before admission she noticed a pimple over her right breast. On the day of admission she became collapsed and dyspnœic.

On admission she obviously had severe peripheral circulatory failure; the blood-pressure was not recordable. The sore was typical of a malignant pustule; there was much œdema and hæmorrhagic infiltration over the right breast.

Treatment and progress.—In view of the circulatory failure an intravenous saline drip containing noradrenaline was set up; and intramuscular crystalline penicillin 250,000 units six-hourly was administered. After twenty-four hours there was no improvement in peripheral circulation, and although the serum-potassium and serum-sodium levels were normal it was considered advisable to replace the noradrenaline by hydrocortisone. Despite this change extreme peripheral failure persisted for sixty hours, during which the blood-urea rose from 81 to 108 mg. per 100 ml. Thereafter she began to improve, but, as in the other cases, there was some extension of the lesion for the first three to four days. After nine days a secondary sore appeared some 3 in. below the anthrax sore; this sore consisted of a blood-filled vesicle, and was considered to be a trophic lesion due to the extensive œdema further precipitated by the prolonged hypotension. Smears of the original sore were positive for *B. anthracis*, but as expected the "trophic" sore was negative. Blood-cultures were sterile. During her period of peripheral failure she complained of precordial pain, but an electrocardiogram was essentially normal. This patient was discharged after five weeks with both sores granulating. Scarring is to be expected.

Case 4.—A man, aged 29, who worked at the crushing mill, was admitted with a thirty-six-hour history of a sore over the right malar eminence. He had regarded the sore as a boil, but became worried when his face began to swell. On admission he did not look ill and was afebrile. The lesion was a typical malignant pustule with surrounding œdema and regional adenitis. He was treated with phenoxymethylpenicillin 250 mg. six hourly, and the lesion began to regress within twenty-four hours. The resultant scar will be small.

Clostridial Empyema

Table II shows the ages and occupations of two men in whom empyema due to clostridial infection developed.

TABLE II—DATA ON TWO CASES OF CLOSTRIDIAL EMPYEMA

Case no.	Sex	Age (yr.)	Occupation	Site	Date of admission
5	M	30	Process worker	Rt empyema	March, 1953
6	M	44	Process worker	Lt pneumonia plus effusion	March, 1958

While it seems strange that clostridial organisms should infect previously healthy lungs, I am convinced that this was so in each of these cases. Neither patient had any history of chronic or recent pulmonary infection. In each case large gram-positive bacilli were seen in large numbers on direct examination of pleural fluid and specimens of sputum.

Case 5.—A man, aged 30, employed at the bone-crushing plant, was admitted with a ten-day history of right-sided chest pain, preceded by rigors, and of cough which was at first unproductive. Six days before this illness began typical herpes zoster had developed over the right side.

On admission he looked very ill and his temperature was 102 F. Healing herpes zoster lesions were noted in the right hypochondrium. The physical signs of a right-sided pleural effusion were present. Aspiration of the right chest yielded 16 oz. of chocolate-coloured fluid with a glue-like odour. Direct examination of this fluid showed large gram-positive bacilli. Sputum samples, too, were positive for clostridia. Clostridial organisms were recovered on anaerobic culture. Later these were identified as *Clostridium tertium*.

Treatment was by daily aspiration and instillation of oxytetracycline together with oral oxytetracycline.

Progress.—Daily examination of the pleural fluid showed a gradual disappearance of the organisms; after seven days no organisms were seen and the fluid was sterile. Nevertheless, the fluid persisted for six weeks, and during the last two of these weeks closed pleural drainage was in operation. He remained febrile for four weeks, but his general condition improved steadily. Chest radiographs showed considerable collapse of the right lower lobe with air and fluid in the pleural space. What was reported as air was considered to be gas from the organisms, since the aspiration was carried out carefully with a two-way tap. Later radiographs showed improvement, and in eight weeks the only remaining lesion seen on the radiograph was obliteration of the right costophrenic angle. The patient was then discharged and is still well.

Case 6.—A man, aged 44, also employed at the bone-crushing plant, was admitted with a history of an influenza-like illness which lasted for seven days. His principal symptoms were severe frontal headache and left-sided chest pain aggravated by movement, deep breathing, and coughing; the cough was productive and sputum rusty. There was a previous history of left-sided dry pleurisy twenty years ago.

On admission he looked anxious and was dyspnœic and slightly cyanosed. The blood-pressure was 130/85 mm. Hg. There was no evidence of any cardiovascular disease. The physical signs of a left-sided pleural effusion were present. 18 oz. of thin brown fluid was obtained by aspiration of the left chest. Direct examination of this fluid showed numerous large gram-positive bacilli.

Treatment.—In view of the patient's occupation and the experience of the previous case he was treated by oxytetracycline both intrapleurally and orally.

Progress.—Anaerobic culture of the fluid showed that the organisms were of the clostridial group. Further investigation suggested that they might be *Cl. œdematiens*, but this was not proved and the organisms have up to the present not been specified. A chest radiograph confirmed the presence of

pleural fluid, and also showed underlying consolidation of the left lower lobe. Specimens of sputum also contained clostridial organisms. The patient was febrile for twenty days, but at the end of that time was very much improved. After four weeks no further fluid could be obtained by aspiration although a chest radiograph at this time suggested that fluid still remained. After nine weeks chest radiography showed extensive opacity over the left lung field, but this was thought to be due mainly to pleural thickening. The patient is now considered to be well and only the signs of pleural thickening persist.

It is not uncommon to find clostridial organisms in the sputum of patients with chronic pulmonary infection. The two patients here described were not suffering from chronic bronchitis. Only one of them had a history of previous chest disease—pleurisy twenty years before. The pleural fluids on direct examination showed numerous clostridial organisms. Both workers were employed in an atmosphere heavily laden with fine bone dust, which on repeated sampling contained the spores of *B. anthracis*; although no specific examinations for clostridial spores were made it is reasonable to assume that such spores could also be present. Indeed I have been informed that in investigations of bone meal for anthrax, clostridial growth has to be suppressed before inoculating guinea-pigs (J. H. C. Walker, personal communication). It is remarkable, however, that hitherto no cases of pulmonary anthrax have occurred among the workers in this factory.

Summary

Four cases of cutaneous anthrax among workers in a bone-meal factory are described. One of the patients had severe peripheral circulatory failure, although there was no evidence of septicæmia.

Two cases of empyema presumably due to clostridial infection suggest that such infection may be a further hazard among workers in this industry.

My thanks are due to Dr. P. Browning for identification of *Cl. tertium* in one of these patients; to Dr. J. G. Goudie for the bacteriological examinations in the anthrax patients; to the Central Veterinary Laboratory at Weybridge, Surrey, for their reports on the various bone samples submitted for examination for anthrax infection; and to Dr. J. Ramage of Larkfield Hospital, Greenock, for electrocardiographic examination of case 3.

ANTHRAX AND BONE-MEAL FERTILISER

D. M. GREEN
M.D. St. And.
LECTURER IN BACTERIOLOGY, UNIVERSITY OF ST. ANDREWS, QUEEN'S COLLEGE, DUNDEE

W. M. JAMIESON
M.D. St. And., M.R.C.P.E., D.P.H.
PHYSICIAN-SUPERINTENDENT, KING'S CROSS HOSPITAL, DUNDEE

WE have previously reported anthrax in six patients in whom the infection was derived from bone-meal fertiliser (Jamieson and Green 1955). We expressed the view that bone-meal used in this country should be rendered safe from the hazards of anthrax. In February, 1957, the Minister of Health announced the setting up of a committee of inquiry

"To consider the existing legal provisions concerning the importation of goods infected or likely to be infected with anthrax and the precautions to be taken in connection with such imported goods for the protection of the health of persons and to make recommendations" (see *Lancet* 1957).

Since our last report, we have seen four further cases of anthrax. One patient was a veterinary surgeon who contracted the disease through contact with an infected animal. The other three gave histories of having handled bone fertilisers, and *Bacillus anthracis* was isolated from samples of bone fibre handled by one of them (case 3).

Case-reports

Case 1.—A farm labourer, aged 28, was admitted to hospital with a typical anthrax lesion on the dorsum of the left hand. He had cut the hand 3 weeks before; this wound had healed, but 2 days before admission he had scratched the part again, and this was followed by the development of the typical lesion. He had been handling a "commercial fertiliser" which probably contained bone-meal. Direct microscopy of material from the lesion showed gram-positive bacilli morphologically resembling *B. anthracis*. Culture and guineapig inoculation were negative. The patient was treated with combined penicillin and streptomycin and recovered completely.

Case 2.—A farm grieve, aged 53, was admitted to hospital with a lesion on the right side of neck which was typical of anthrax after the acute phase. 3 weeks before, he had noticed a small "boil" on the neck; and this had progressed, causing much swelling of neck and face. His own doctor had treated the lesion with penicillin. Bacteriological examination was not carried out until his admission to hospital; and, not surprisingly, this was negative, microscopically and culturally, for *B. anthracis*. The patient recovered fully. About the time of developing the lesion, he had been actively engaged in spraying fields with bone-meal fertiliser. Samples of the fertiliser were not obtained for examination. There had been no animal deaths on the farm.

Case 3.—A boy, aged 15, was employed as a nursery-worker. He was admitted to hospital with typical anthrax of the left cheek. 10 days before he had scratched his face and this was followed by the development of the malignant pustule. Microscopical examination of material from the lesion showed organisms morphologically resembling *B. anthracis*, but culture and animal inoculation were negative. He recovered completely after treatment with combined penicillin and streptomycin. This boy had been preparing soil for growing tomato plants, which involved the use of bone-fibre. While some of the workers wore gloves for this job, he himself had not done so. Four samples of the material used by him were obtained, and *B. anthracis* was isolated from three of them.

Method of Isolation of B. anthracis

The four samples of bone-meal fertiliser consisted of three samples of bone fibre from 1 cwt. (112 lb.) bags—very dusty material with fibres in it—and one sample of bone-meal from a $1^1/_2$ cwt. bag which looked like "meal" with fibrous material. The source was either Indian or Argentinian, or possibly a mixture from the two sources. The samples were treated in the following manner:

The material was shaken up with sterile distilled water (25 g. in 100 ml.) and after standing for two hours, with occasional shaking, the supernatant fluid ("wash") was heated to 70°C for 10 minutes. Pour plates were made of varying amounts in 'Yeastrel' agar, which gives deep colonies of *B. anthracis* of typical appearance (A. J. H. Tomlinson, personal communication). The formula for yeastrel agar was as follows:

Eupeptone no. 2	5 g.
Yeastrel	3 g.
Agar (Davis)	10 g.
Distilled water	1000 ml.

Autoclave at 15 lb. for 15 minutes to dissolve, make to pH 8·2. Steam 30 minutes. Filter through 'Chardin', if necessary adjust to pH 7·6. Sterilise in autoclave at 10 lb. for 10 minutes.

Cultures were also made in the selective medium described by Pearce and Powell (1951). In one of the samples of bone fibre, *B. anthracis* was isolated from the yeastrel agar. The strain gave a characteristic appearance in a Craigie tube and killed a guineapig, which showed typical macroscopical and microscopical appearances and a McFadyean's reaction.

The remainder of the wash was centrifuged, and half the deposit was injected into a guineapig which had been protected 24 hours previously with polyvalent gas-gangrene containing *Clostridium perfringens* antitoxin 2000 units, *Cl. septicum* antitoxin 1000 units, *Cl. œdematiens* antitoxin 2000 units, and tetanus antitoxin 500 units.

In the case of the three samples of bone fibre, the guineapigs died between 24 hours and 72 hours after injection. Animals which died at 72 hours showed typical macroscopical and microscopical appearances of anthrax, and *B. anthracis* was isolated from the blood and tissues. In two animals which died 24 hours after the injection the necropsy appearances were typical of gas-gangrene infection, but in one of them cultures from the heart blood and site of inoculation gave isolations of *B. anthracis*.

No isolation was made from the $1^1/_2$ cwt. bag of bone-meal by either animal inoculation or cultural methods.

The strains isolated were tested in vitro by a plate technique using Evans' 'Sentest' tablets, and they were all sensitive to penicillin, streptomycin, aureomycin (chlortetracycline), oxytetracycline, and erythromycin.

Comment

Since 1952 ten cases of anthrax have been admitted to King's Cross Hospital. In four cases there is bacteriological confirmation that the patients had handled infected bone-meal fertiliser; strong presumptive evidence of bone meal as the vehicle of infection was present in a further five; one case was not directly associated with bone-meal. The infected bone material was imported. These findings may be of interest in view of the Committee of Inquiry presently examining the problem of goods likely to be infected with anthrax.

Davies and Harvey (1955) demonstrated *B. anthracis* by animal inoculation in 5 (12%) of 41 cargoes of imported bone-meal over 18 months. They pointed out that the infectivity for man is probably low since only two cases of anthrax were seen during the 18 months. In the present series the patient with whom the bone fibre was associated was not the only person to handle the material, but he appears to have been the only one infected.

Summary

A history of having handled bone-meal products was given in three out of four cases of anthrax. In one case samples of bone fibre and meal were obtained, and the bone fibre yielded *B. anthracis*.

The bone-meal products were apparently Indian or Argentinian in origin, or a mixture of both.

The strains isolated were all sensitive to penicillin, streptomycin, aureomycin, oxytetracycline, and erythromycin.

We should like to thank Prof. W. J. Tulloch for facilities and Dr. A. J. H. Tomlinson for giving us details of the yeastrel agar and permission to describe it; Dundee Sanitary Department for obtaining the bone fertiliser and for information concerning its origin; and Miss I. M. B. Graham for technical assistance.

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Addendum

We have seen within the past four weeks a further case of anthrax. The patient was a seedsman aged 17 years with a typical lesion on the right forearm. We have been able to demonstrate *B. anthracis* from a sample of bone-meal handled by him, both by isolation in yeastrel agar and animal inoculation.

In England Now

A Running Commentary by Peripatetic Correspondents

IT is now some time since we became tired of writing scientific papers in which nobody was interested. We felt that our psyche was cramped by these endless processions of *facts*, the limitless calvacade of introductions, techniques, results, discussions, and summaries, with their subsidiary acknowledgments, references, and illustrations. It came to us that what we needed was an outlet for our personality, a larger canvas for our brush. We determined to let our soul take wings. We would write a book.

Initially we detected a pervading apathy among the various publishers we attempted to favour with our custom. "We recognise, of course," their letters began, "that the work you have been doing is of first-rate importance, but . . ." Eventually, however, we succeeded in discovering a kindly firm who were basically sorry for us, and obtained an imposing-looking memorandum covered in red seals, in which we were hereinafter described as the author.

The first proofs arrived heavily annotated in a fine Italianate script by the translator. "Cytoarchitectonics of the Umbilicus," we had written baldly, "1. The Philosophical Background." This had now become "Perp. Titl. 258 12 pt. cap. #d. $1^1/_2$ pts. R4 rule 24 ems. Sub. Perp. 239 18 pt. fig. ital. caps. No. ⊙s", and we were delighted to find ourselves so much in the technical swim. We discoursed at length to our colleagues at morning tea on the relative advantages of Times bold face and Garamond in the production of scientific literature, and at lunchtime we went out and bought a spotted bow tie. In the afternoon, however, we were mildly dashed to find, lurking among the pages, little interdepartmental publisher's messages. They began innocently enough with "Margin sheet pl.", but soon we began to detect a somewhat censorious, hectoring attitude. "Charlie," read the second, "doubtful Latin p. 15." Others were briefer, but not less to the point. "C.P.," they said, marking our favourite purple passage, "? constr. Yrs. E.R." After a time relations between C.P. and E.R. became slightly strained, and a brisk argument developed (over our prostrate body) on a grammatical point on p. 127. But on the whole we saw no cause for serious alarm, and we relaxed into a happy daze of authorship.

Our first intimation that all was not well came with the arrival of the first press copies, in a parcel bearing the boldface label OF NO COMMERCIAL VALUE. Since then we have seen all too clearly what they meant. The reviewers have on the whole been tolerant, but they have made it clear that this has been a difficult task. "Too long," they said, stifling a yawn. "Too short," said others impatiently. "Too detailed," said the clinical types, throwing down their pens to dash off to a subtotal viscerectomy. "Too vague," said the back-room boys with scarcely concealed contempt. "Too orthodox, too speculative; too turgid, too simple; unsuitable for students unsuitable for teachers, unsuitable for research workers, unsuitable . . ."

The other day a distinguished guest was rummaging about in our library of *Penguins* when we heard our youngest child say to him in a sad meditative voice, "My Daddy wrote a book once. It didn't sell."

* * *

Great progress is being made in medical knowledge and, for this, much credit must go to the epidemiologists who patiently ferret out fresh factors in the production of disease. Thus in recent years we have learnt that the use of tobacco may well give us cancer of the bronchus or, at the best, chronic bronchitis, and, as if these were not enough, the smoker is now threatened with cancer of the bladder for his indulgence. The comparatively virtuous glutton has been warned that his habits may lead him to a coronary infarct. Resolute tipplers have shrugged aside fibrotic threats to the liver and neoplastic ones to the larynx only to find that the epidemiologists now promise them an increased risk of lung cancer because of prolonged residence in stuffy bars and drinking dens.

It is not surprising if some of us are beginning to regard epidemiologists with considerable disfavour, for every fresh discovery of theirs only intensifies our chronic anxiety state. But, to be fair, we must except the Pneumoconiosis Research Unit experts who cheered us up somewhat by reporting that inhalation of coal dust in moderate quantities would improve lung function. We are now wondering if addiction to coal-dust snuff could beneficially take the place of our present weaknesses.

• • •

There is no doubt that convalescence broadens the scope of one's reading. Never before have I had time to study those glossy circulars from the drug firms. After carefully excluding those dangerous envelopes concealing samples of tablets, I used to distribute all circulars, exactly, among the younger members of the family at breakfast. (And woe betide me if one found more blotters than the other.) But now the circulars come up to the bedroom with the breakfast tray and form part of my morning literary activity.

The drug firms may not always quote the price of their product, but even the Hinchcliffe Committee would acknowledge that on occasion they are candid friends. For instance we are told that one drug—with a reputation in tuberculosis but also useful in a variety of other diseases—has side-effects including constipation, difficulty in micturition, orthostatic hypotension, insomnia, impotence, headaches, and dizziness. As if that were not enough, *pour encourager les autres*, there is also the chance of having muscle tremors, peripheral neuritis, and epileptiform attacks. And finally the *coup-de-grâce*—jaundice.

There is a lot to be said, sometimes, for confining oneself to the disease with which one starts.

• • •

Lincoln, in Massachusetts, U.S.A., is a little town close to the battlefields where the shot " heard round the world " was fired and English soldiers fought Englishmen " to keep the past upon its throne ". When we moved to Lincoln as temporary summer residents, we were warned that even though we owed our allegiance to Her Majesty the Queen, we would have to take part in the town's annual Independence Day parade.

At 10 A.M. on a brilliant July 4 morning the parade moved off, led by the white-helmeted band of the National Guard and immediately followed by the town's oldest and newest fire-engines with sirens a-howling. Then came a long line of symbolic floats carrying Lincolnites, old and young, in fancy dress. We modestly brought up the rear in a Hillman Minx, its front decorated with a Union Jack and the boot surmounted by the Stars and Stripes and the Union Jack fluttering in unison. In the hope of furthering Anglo-American relations, we had attached large placards bearing the jingles: " 1775 but we're still alive " and " 1958, now we cooperate ".

As we slowly drove along the route, the faces of the crowd looked puzzled and the applause was rather thin, so that our chances of winning any kind of prize seemed remote. Then, at the last moment, just before we reached the judges' stand, we heard a loud voice: " Guess they must be from the South." We treasure our third prize greatly.

The echoes of that shot so many years ago are dying away.

• • •

Science fiction has occasionally dealt with the psychiatric aspects of lunar voyages, and now that recent reports of plans to send rockets to the moon suggest that space travel may soon cross the line between fantasy and reality, is it not time to consider a rejuvenation of the term " lunacy " in psychiatric nomenclature? Perhaps a case could even be made for a lunatic syndrome, manifested by a morbid preoccupation with space travel, the presence of stellar phosphates in the urine, and, in the fully developed case, distortion of the features resulting in moonface. Treatment of " moonshine " as it might come to be called colloquially, would probably be by administration of drugs such as ' Lunamil ' or ' Lunatil ' (one tablet three times a light-year) or by a process of conditioning by which the patient would be brought to earth.

Letters to the Editor

THE DENTAL SERVICE

SIR,—Your leading article of June 21 discusses how dentists can be induced to give more of their time to the "priority classes"—children and expectant and nursing mothers. But you do not mention the only way in which the profession in this country can provide adequate dental care for the whole population and at the same time recover its status. I am speaking of the proper use of the right kind of ancillaries.

Most dental students, on qualification, leave their hospital with high ideals and the ability to do, albeit slowly, almost everything a dental surgeon can do. Our job can be very interesting, and the training we receive at hospital lays emphasis on its most interesting aspects—incidentally those which require intelligence and mental skill. But what now happens when the young man gets into general dental practice? He finds immediately that the one part of National Health Service dentistry which is completely unpaid is the exercise of diagnostic ability and the use of the mental skills towards which his hospital training has been largely directed. He finds that he is doing piecework and that his income for the rest of his career will be tied irrevocably to his output—regardless of its standard. Thus committed for life to routine backbreaking work, paid at piecework rates, can he any longer be truly described as a professional man?

The alternative is not, as some of my colleagues think, higher pay for the same job—which is in any case unattainable—but a change in the pattern of our work. No doctor would consider making surgical boots for his patients, or carrying out the many mechanical and semi-mechanical procedures necessary in treatment. He has working for him a host of ancillaries—physiotherapists, radiographers, instrument-makers, nurses, and the like. This is the way that dentistry also must go if it is to remain a profession. Instead of deteriorating into hack workers, we dental surgeons must develop into a prescribing profession, in which we ourselves undertake only the more advanced procedures.

There is in fact only one way to regain our proper position, and that is that we ourselves should plan and undertake, slowly and deliberately, the incorporation into dentistry of the right kind of ancillaries—not half-trained dentists, but fully trained technicians in one branch of purely technical dentistry. These ancillaries would work under conditions laid down by the profession itself.

Not only would this give a better service to the nation, and a better status to the profession, but it would also enable us to reverse the adverse pattern of earnings repeatedly pointed out in reports upon our profession, and enable dental surgeons, like physicians, still further to increase their skill and value to the community with experience.

I am sure that ancillaries, properly used, are for the good of the profession, and it is up to us to see that those already legalised, and any that may be legalised in the future, are properly employed to increase both the efficiency and the status of dentistry in this country.

London, W.1. J. H. HOVELL.

CHRONIC DISSECTING ANEURYSM OF THE AORTA

SIR,—The interesting report by Mr. Eastcott and Dr. Sutton (July 12) calls for comment.

(1) They speak of the diagnosis of dissecting aneurysm as "being rarely made". This is no longer true. With the increasing recognition of the clinical signs of dissecting aneurysm it is becoming possible to diagnose the majority of cases during life (as their case was, by Professor Rosenheim). Of the last 34 cases seen at the Radcliffe Infirmary (24 confirmed at post-mortem, 5 having died at home and 5 being still alive) a correct clinical diagnosis was made in 21.

(2) Radiological signs can be useful, even diagnostic.[1] Widening of the aortic shadow as compared with previous films may, as Mr. Eastcott and Dr. Sutton suggest, be open to misinterpretation, but it is often a most helpful sign. So is the appearance of calcification an abnormally long way in from the edge of the aortic knuckle.

(3) The fact that a dissecting aneurysm extends from above to below the renal arteries does not necessarily, or even probably, mean that there is any interference with the blood-supply to the kidneys. The dissection may not embrace the whole circumference of the aorta and it seldom extends into branch arteries, so that, although the dissection may surround the origin of the renal, or other, artery its lumen is not narrowed.

(4) If the diagnosis of dissecting aneurysm has been made on clinical and radiological grounds one wonders whether it is wise to attempt to confirm it by arteriography. The arteries of patients who have died from dissecting aneurysm are often friable; an arterial wall remote from the site of dissection can often be split into two layers by quite gentle rubbing. Histological examination usually reveals marked cystic medial necrosis. Although no reports have been published, so far as I know, of harm resulting from arteriography in cases of dissecting aneurysm it appears to be a risky procedure.

Nuffield Department of Clinical Medicine, Radcliffe Infirmary, Oxford. D. A. PYKE.

INFLUENZAL ENCEPHALITIS

SIR,—We have read with much interest the accounts of encephalitis and neurological disorders associated with influenza by Dr. Flewett and Dr. Hoult, and Dr. McConkey and Mr. Daws, in your issue of July 5.

May we draw the attention of pathologists to the importance of both virus studies and histological examination of the brain in all influenzal deaths, because it seems likely that some cases of influenzal encephalitis are missed at necropsy?

All are probably manifestations of the same pathological process, but further studies as suggested are still necessary to establish this. Fatal cases of this important form of encephalitis should be correlated with the histological classification of encephalitis described by Greenfield.[2] Complicated neuropathological techniques are not necessary for a diagnosis, but the brain should be fixed suspended in formol saline before sectioning. The histological picture of hæmorrhagic leuco-encephalitis is very characteristic. The cortex and basal ganglia are spared, and the lesions in the white matter are of five chief types:

(1) Necrosis of vessel walls including both small veins and arteries.[3]
(2) Œdema of perivascular distribution with degenerative changes in the astrocytes.
(3) A perivascular leucocytic exudation which becomes monocytic at a later stage.
(4) Zones of perivascular demyelination containing excess microglial or histiocytic cells.
(5) Perivascular ball or ring hæmorrhages.

Meningeal infiltration by neutrophil leucocytes, lymphocytes, and histiocytes, which is often quite heavy, is also observed.

These lesions are all readily recognisable in paraffin sections stained by routine hæmatoxylin and eosin. They should be searched for in every case.

Since 1953 we have seen 6 cases of encephalitis; of these, 5 occurred during influenzal epidemics. The 3 that came to necropsy all showed the histological picture we have described. Greenfield [4] has obtained influenza virus A from the pulmonary lesions of a similar case but not from the brain. We therefore agree with the view expressed in your annotation that this type of encephalitis is the result of influenza. We do not feel that such post-mortem findings can be explained by "severe anoxæmia and venous congestion". Also, we would like to point out that in most fatal cases of hæmorrhagic leucoencephalitis [2 5 6] the cerebrospinal fluid at some time has shown a leucocyte count of several hundred per c.mm. and a correspondingly increased protein. This was our experience also.

Finally, we await with interest the report of the histological examination and classification of the brain in the first case described by Flewett and Hoult, from the lungs of which influenza virus was isolated.

Royal South Hants Hospital, Southampton. R. A. GOODBODY
R. J. MCGILL.

INTESTINAL ABSORPTION OF VITAMIN B_{12}

SIR,—Dr. Heathcote and Dr. Mooney (May 10) have suggested that vitamin-B_{12}-peptides are absorbed from the small intestine by a process of diffusion across the intestinal wall. It occurred to us that this hypothesis could be tested by examining the intestinal wall for the presence of such peptides.

We have, therefore, fed radioactive vitamin B_{12} to four rats and, in each case, after 1 hour, have removed the portion of intestine which contained nearly all of the radioactivity taken up in this time. The length of intestine removed was opened by a longitudinal cut, washed, and then homogenised in saline. The homogenate was ultrafiltered through Visking membrane. Had vitamin-B_{12}-peptide complexes been present, they would have passed into the ultrafiltrate and an appreciable amount of radioactivity would have occurred in this situation. In actual fact the radioactivity in the ultrafiltrate was only a few per cent. of the total uptake. We can assume, therefore, that vitamin B_{12} in the process of absorption is bound in such a way as not to be ultrafilterable, and that it is not bound to a peptide. The small amount of activity we found in the ultrafiltrate could be explained in terms of a dissociation equilibrium.

Examination of the intestinal contents revealed a somewhat greater proportion of ultrafilterable vitamin B_{12}. This, of course, may be the vitamin in the free state, but equally well could be a peptide complex.

Our observations, therefore, lead us to conclude that the vitamin is not absorbed as a peptide complex. They do not, however, exclude the concept that vitamin-B_{12}-protein complexes are broken down to vitamin-B_{12}-peptides in the intestine by a process perhaps involving intrinsic factor [7] and that the vitamin is then transferred to a protein acceptor in the intestinal wall. Studies of vitamin-B_{12} binding by intrinsic factor preparations (Latner and Raine, unpublished observations) make it unlikely that binding to intrinsic factor itself is a preliminary to absorption.

We should also like to point out that analysis in terms of the response at the 15th day [8] of the clinical results published by Dr. Heathcote and Dr. Mooney indicates

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that relatively small quantities of vitamin B_{12} were absorbed. This too can be taken as evidence against the absorption by simple diffusion of unaltered vitamin-B_{12}-peptides, since the amounts of vitamin absorbed were very small fractions of the total amounts administered.

We have, of course, yet to see the proof that Dr. Heathcote and Dr. Mooney were actually administering a vitamin-B_{12}-peptide and not a mixture of the free vitamin and a peptide. In our opinion, the absorptions they obtained might well be expected from the administration in similar dosage of vitamin B_{12} alone, and control investigations are badly needed.

Department of Pathology,
King's College, University of Durham,
Royal Victoria Infirmary,
Newcastle upon Tyne.

C. GREEN
A. L. LATNER.

DILUTION ANÆMIA

SIR,—The "physiological anæmia of pregnancy" is due to an increased plasma volume.[1–4] Likewise, in chronic myelogenous leukæmia increased plasma-volumes have been found.[5 6]

It is conceivable that low concentrations of hæmoglobin (Hb) in the peripheral blood may be explained as dilution effects in other states. Such patients may have a normal amount of total body hæmoglobin (THb) (i.e., 1·12 g. per kg. in males and 0·86 g. per kg. in females) and an increased total blood-volume.

FOUR CASES ILLUSTRATING DILUTION ANÆMIA

Clinical diagnosis	Hb concentration	Calculated normal THb (g.)	Actual THb in g. (% of calculated normal)	Calculated normal blood-volume (ml.)	Actual blood-volume in ml. (% of calculated normal)	No. of blood-transfusions given
Chronic nephritis with secondary anæmia	72%	339	350 (*106*)	2400	3500 (*146*)	>15
Postural hypotension with anæmia*	61%	592	556 (*94*)	3800	5900 (*155*)	>10
Myeloma	66%	405	449 (*111*)	2900	4800 (*165*)	23
"Hepato-megalic anæmia"	62%	625	591 (*95*)	4100	6200 (*152*)	>12

* This case has been reported previously.[7–9]
Hb, THb, and blood-volume (estimated same day) in 4 patients. Hb 100% for males = 15·4 g. per 100 ml.; for females 13·9 g. THb determined by the alveolar carbon monoxide method [10]; normal blood-volume = normal THb ÷ normal Hb concentration.

It is questionable whether it is possible or even desirable to increase the THb above the normal amount in such cases, in an effort to make the hæmoglobin concentration normal, by giving blood-transfusions; and it does not seem to be known whether adequate circulatory function or even the feeling of wellbeing is more dependent on the THb (i.e., total red-cell volume) or on the hæmoglobin concentration. Until further information is available it seems reasonable to regard patients with normal THb as healthy from the point of view of anæmia.

But cases of "dilution anæmia" may not be diagnosed as such and may be treated as having genuine anæmia. Because the "anæmia" is refractory to other treatment, these patients are sometimes given numerous blood-transfusions (as well as parenteral iron and liver or vitamin B_{12}) over long periods of time (see accompanying table). The purpose of this letter is to draw attention to these states in the hope that blood-transfusions, which are probably unnecessary in simple hypervolæmia, and which are expensive and not without danger, may be avoided.

A more thorough examination of dilution anæmias is in preparation.

Departments of Internal Medicine
and Clinical Physiology,
Karolinska Institutet,
Serafimerlasarettet, Stockholm.

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SHOULD BIBLIOGRAPHIES GIVE TITLES OF PAPERS?

SIR,—The bibliography of American medical papers is much more valuable than that of British papers, because of the almost invariable American practice of giving titles. Is it not time that we in this country adopted the American practice, and will not you, Sir, pioneer this advance?

The Middlesex Hospital,
London, W.1.

DAVID H. PATEY.

*** We agree with Mr. Patey that there are advantages in giving titles in references; but the extra space needed is, we think, too great to justify making this change in *The Lancet*. Under our present system we use a weekly average of between one and two columns for references to original articles. To include titles of papers would at least double this consumption. To compensate for this, we should have to exclude an article of perhaps 1000–1200 words.—ED. L.

PHYSICAL CHANGES IN THE PROLAPSED DISC

SIR,—Some of the questions raised in your annotation [1] are answered in work already published by us.[2–10] This was recently summarised by us at the March meeting of the Comparative Medicine Section of the Royal Society of Medicine.[10] To reiterate briefly: the tendency to disc prolapse depends upon the intra-disc tension and the structural state of the annulus fibrosus and the nucleus pulposus.

Increase of intra-disc tension possibly arises as a result of the "triggering" of a sequence of changes probably by an endocrine factor whereby, amongst other possible changes, depolymerisation of the polysaccharides of the nucleus leads to increased power of fluid absorption and thus increased fluid absorption with resultant rise in intra-disc pressure. As the depolymerised molecules are removed there is a return to the status quo with relief of symptoms. With each episode of symptoms, this process is repeated so that the total polysaccharide content is reduced, producing a degenerated, desiccated disc. A stage will be ultimately reached whereby the concentration of the polysaccharide and power of fluid absorption are so reduced that prolapse cannot occur.

Our intra-disc pressure measurements showed fluid absorption to produce the highest pressures in the 35–55 age-group, which parallels the incidence of disc prolapse. Our X-ray crystallographic studies have shown that beyond the age of 40 the reduction of polysaccharide, though relative, is associated with precipitation of the collagen. Such a process causes the incompressible gel structure of the nucleus pulposus to change to a fibrosed mass incapable of *uniform* transmission of stress. This uneven dissipation of stress causes gradual attrition of the annulus. With increasing age, precipitation of the collagen in the annulus results in decreased elasticity. We

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9. Bernardi, G., Happey, F., Naylor, A. *ibid.* 1957, **180**, 1341.
10. Naylor, A. *Proc. R. Soc. Med.* (in the press).

suggest that nuclear herniation becomes less frequent in the older age-groups partly because of these changes in the gel structure and function of the nucleus and partly because there is insufficient polysaccharide to develop an adequate intra-disc pressure.

Answering Mr. Charnley's question,[11] we think this outline of our views parallels the concepts described in his letter.

Physics Department,
Institute of Advanced Technology,
Bradford. D. L. SMARE.

Textile Department,
Institute of Advanced Technology,
Bradford. F. HAPPEY.

Royal Infirmary,
Bradford 9. A. NAYLOR.

SIR,—At the 1954 autumn meeting of the British Orthopædic Association when Mr. Charnley introduced into a discussion his postulate of the hyperhydration of the nucleus, he prefaced it with the remark that this was "a little fairy tale which he liked to tell to his students". I thought that this terminology indicated a becoming but proper modesty—becoming because the idea could clearly be the source (which is always necessarily imaginative) of a new and valuable concept, and proper because a proved factual basis for the concept was lacking. So far as I know no experimental or other confirmation has since appeared, but the postulate seems none the less to be in some danger of being elevated into a thesis.

When I first began my investigations into disc behaviour six years ago, Mr. Charnley's original observations had already been published, and I expected that some evidence of a "super-saturation" phenomenon would indeed come to light. This did not prove to be so, but I do not think that the divergence between the two views is as complete as is being implied. Some confusion may well arise from the (to my mind) incorrect use of the word "desiccation". A man who has been sitting with rubber boots on and with his socks fully but exactly saturated with water, and who then stands up, is unlikely to complain that his feet are desiccated, although he may, if of a dispassionate turn of mind, concede that his socks have become drier. An inefficiently functioning nucleus, similarly, becomes "drier" under load, but the significance of this lies in the excess of fluid which is thereby liberated. Our rubber-booted, wet-socked citizen becomes conscious of water-exchange on weight-bearing; our annulus in like manner suffers from the repeated appearance of abnormally large volumes of suddenly "unbound" tissue fluid. Furthermore as the annulus loses its elasticity and the nucleus accordingly becomes almost completely unstressed with recumbency, the gel has to work on that part of its imbibition pressure-saturation curve where (the curve being exponential) a given increment in load is accompanied by the maximum change in saturation. And all this in a cavity with two rigid walls and a strictly limited rate of fluid diffusion. If these phenomena are inadequate to explain the eventual rupture of an already weakened annulus, then perhaps I should, in the best Scots manner, take to studying imbibition in another form.

Mr. Charnley cites the difficulty of explaining on this basis the attack of "lumbago" that lasts as long as three weeks. I cannot say that I find such long-lived symptoms and signs common unless in patients who then or subsequently produce root signs. But is there any reason for the pain's not lasting as long if the ruptured fibres of annulus happen to include a sizeable nerve-fibre? Or if a cartilage end-plate is damaged? Or if the pain threshold is low? Or is there any proof that the pathology is in fact then in the disc? Can this picture not appear with facetal joint strains, interspinous ligament tears, minor congenital abnormalities of dura or vertebræ, with the vicious circle of muscle spasm—pain—muscle spasm, or even perhaps—since fancy may apparently sometimes obtrude in discussions of fact—the incarceration of dephlogisticated air (notoriously obdurate of absorption as I understand) in a dura pocket?

The fact is, of course, that none of us can answer even the beginnings of all the questions in disc pathology. We are entering a field of what could optimistically be described as new knowledge, but which is more realistically seen as fundamental ignorance. The basic chemistry and the metabolism of the polysaccharides are closely involved, and are so far largely unknown. It is clearly possible that Mr. Charnley's postulate will subsequently find confirmation, and that the physical abnormalities I have found are of less significance than I think, or capable of different interpretation. But in so difficult a field would we not do well, in the meantime, to avoid discussions based on conjecture, or on intuition, or on highly subjective considerations such as the character of the pain produced, and concern ourselves with such facts as have been demonstrated? There is already a reasonable basis of pathological physics to work on and a great mass of accurately observed anatomical change. The next step should surely be to enlarge or to revise that basis by physical experiment or to investigate its chemical, and eventually its metabolic, background.

Royal Infirmary, Aberdeen. NEIL G. C. HENDRY.

11. Charnley, J. *Lancet*, 1958, i, 1277.

RECORDS OF IMMUNISATION

SIR,—I have read with interest the correspondence which started with Dr. Randall's letter of May 3.

In the Southern Gas Board we decided, in consultation with Dr. H. J. Parish, of the Wellcome Research Laboratories, to offer active immunisation with tetanus toxoid on a voluntary basis to all men employed in our mains and service laying gangs.

The records of the inoculations are entered on the cards provided by Messrs. Burroughs Wellcome, and on completion of the third injection the card is given to the patient with instructions to carry it on him and, should he at any time be taken to hospital, to present the card to the doctor who treats him.

There is on these cards plenty of room for the inclusion of details of any other immunising injections which the patient may receive.

Medical Department,
Southern Gas Board, Southampton. M. B. CARSON.

TREATMENT OF NEPHROTIC NEPHRITIS WITH CHLOROQUINE

SIR,—We have observed a favourable effect of chloroquine on the nephritis component of systemic lupus erythematosus.[1] According to Mellors [2] there is a similarity in the pathogenesis of the nephritis of lupus and that of the nephrotic type of chronic nephritis.

Accordingly we have treated in this hospital three patients with the nephrotic type of chronic nephritis by bed rest, low-sodium diet, and chloroquine diphosphate in doses ranging from 0·75 g. to 1 g. daily for 2 to 4 months. In each case the nephrotic syndrome has disappeared, with suppression of œdema, increased diuresis, and subsidence of hæmaturia. Proteinuria fell from 3·2 g. per litre to 0·25 g. in the first patient, from 25·6 g. to 0·20 g. in the second, and from 34·7 g. to 0·20 g. in the third, during a period of 30 days. α_2-globulin fraction and serum-cholesterol became normal and the total serum-protein level rose significantly.

A control group of 26 patients with the nephrotic type of chronic nephritis were observed during 1 month in the same hospital, and were treated with bed rest and low-sodium intake. In this group the variations in proteinuria, serum-

1. Plaza de los Reyes, M., Campos, R., Orozco, R., Matus, I., Berrios, R. *Rev. Med. Chile*, 1958 (in the press).
2. Mellors, R. C., Ortega, L. G., Holman, H. R. *J. exp. Med.* 1957, **106**, 191.

cholesterol, and serum-protein were studied and their standard deviation determined. The proteinuria varied from 6·49 g. per litre to 7·58 g. during the month. The probability that the good results in the chloroquine group were due to chance is less than 1 in 10,000.

Clinical and laboratory control for 2, 3, and 4 months respectively continued to show a satisfactory recovery. No side-effects were observed.

Despite the small number of cases, we feel these results are worth recording.

Aguirre Hospital,
University of Chile, Santiago. M. PLAZA DE LOS REYES.

INTESTINAL ANGINA

SIR,—Your leading article of June 7 is very informative and timely. As former professor of internal medicine at the University of Vienna I feel I should draw attention to the fact that the late Prof. Norbert Ortner was quite familiar with this disease and first described it in all its details long before it was "rediscovered" as a clinical entity. One thing that prevented Ortner's syndrome from being generally recognised was probably his term "dyspragia intermittens angioscleroticus intestinalis". In my *Differential Diagnosis of Internal Diseases*[1] the clinical picture and its history has been briefly discussed.

Los Angeles. JULIUS BAUER.

RADIATION HAZARD IN ANTENATAL RADIOGRAPHY

SIR,—In the investigation of the hazards in diagnostic radiology the recent approach has been to study the histories of the children with leukæmia and other malignant conditions and in retrospect assess the exposure to radiation. The series recorded here consists of all patients referred during the year 1948 for pelvimetry, and although the number is relatively small I feel the results are none the less significant.

The year 1948 has been chosen to give a reasonable period for any harmful effect to become apparent in the children, and pelvimetry examinations have been selected in view of the high radiation dose involved. Information regarding the present wellbeing of the children has been obtained by kind cooperation of the health visitors, without whose help the follow-up would not have been possible, in view of the large population shift within and from Glasgow during recent years.

The investigation covers 148 patients, all referred for pelvimetry to exclude pelvic contraction. The average number of films per patient is 3, which is three times the present figure for the examination. In 1 case, straight films for maturity and viability were taken, and 7 films were used, the largest single figure. As the X-ray unit in use in 1948 is no longer available it is not possible to assess the dose-rates received. The children of 104 of the 148 patients are alive and well, 21 are deceased due to causes listed below, and 23 have not been traced, some having emigrated. Of the deceased there has been no report of leukæmia or other malignant condition.

	No. of deaths
Stillbirth	7
Pneumonia	4
Gastroenteritis	2
Accidents	2
Congenital abnormality	3
Unknown	1
Miscarriage	2

Since these children were submitted to a relatively high radiation dose compared with the present technique it is reassuring to know that as far as can be ascertained no case of leukæmia has been reported.

I should like to thank Dr. R. McG. C. Crawford, consultant radiologist, for suggesting this investigation and for helpful advice. The follow-up of the children's health would have been impossible without the active cooperation of Dr. N. I. Wattie, principal medical officer for maternity and child welfare, and her health visitors.

Southern General Hospital,
Glasgow. W. H. DEMPSTER.

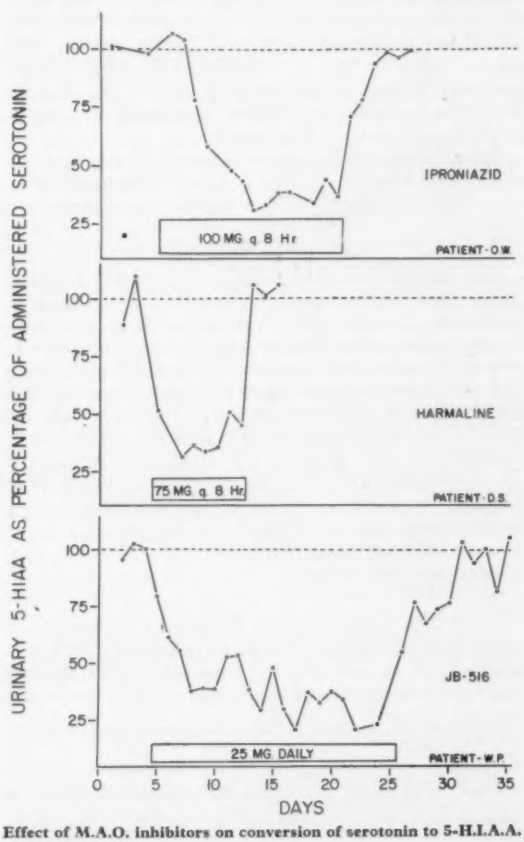
1. Bauer, J. Differential Diagnosis of Internal Diseases. New York, 1955.

A SIMPLE METHOD FOR THE MEASUREMENT OF MONOAMINE-OXIDASE INHIBITION IN MAN

SIR,—There is currently much interest in the therapeutic potential of drugs which have been shown in animals to inhibit the enzyme, monoamine oxidase (M.A.O.). The best-known of these agents, isopropyl-isonicotinyl hydrazine (iproniazid, 'Marsilid'), is being used in psychiatry in depressed patients, as well as in the treatment of two cardiovascular disorders, hypertension and angina pectoris.[1] A pertinent question is whether these agents do inhibit M.A.O. to a significant extent in man and, if so, whether the therapeutic effects are the results of the M.A.O. inhibition. To help answer these questions we have devised a simple test based on the conversion of orally administered serotonin to 5-hydroxy-indolacetic acid (5-H.I.A.A.), the end-product of M.A.O. activity.[2]

Following oral administration of an arbitrary dose of 20 mg. of 5-hydroxytryptamine (serotonin), urine is collected for an 8-hour period and assayed for 5-H.I.A.A.[2] Repetition of this procedure on several successive days establishes a control range of conversion to 5-H.I.A.A. for a given patient, usually between 18 and 22 mg. per 8 hours. This procedure is con-

1. Symposium on Iproniazid. *J. clin. exp. Psychopathol.* suppl., 1958, **19**.
2. Udenfriend, S., Titus, E. O., Weissbach, H. *J. biol. Chem.* 1955, **216**, 499.



Effect of M.A.O. inhibitors on conversion of serotonin to 5-H.I.A.A. in man.

tinued during the administration of a presumed M.A.O. inhibitor.

Although infusions of serotonin are poorly tolerated, the oral administration of serotonin should be of no concern since a common food item, the banana, contains considerable amounts of it.[2] We have administered as much as 50 mg. of serotonin orally to patients without any observable effects, even in the presence of M.A.O. inhibitors. During these studies the only effect observed was orthostatic hypotension, attributable to the M.A.O. inhibitors themselves.

The results obtained with three drugs are presented for illustrative purposes (see accompanying figure). They were administered on a regular schedule, stipulating only that a dose be given 2 hours preceding the administration of serotonin each day. It is apparent that all three drugs markedly reduced the conversion of serotonin to 5-H.I.A.A. Iproniazid and (1-methyl-2 phenyl)-ethyl hydrazine hydrochloride (JB-516)* are examples of long-acting M.A.O. inhibitors. Harmaline, a harmala alkaloid recently shown to be a potent inhibitor of M.A.O. in animals,[4] is an example of a short-acting inhibitor.[5]

The reduction in the percentage of conversion of serotonin to 5-H.I.A.A. indicates that these agents do inhibit M.A.O. in man, and that the inhibition may be quite marked. From previous studies with animals it is known that all three drugs reach the target enzyme throughout the body.[1 5 6] Diminution of 5-H.I.A.A. production by this test may therefore be taken as representative of an overall inhibition of M.A.O., although it presumably measures only the inhibition occurring in the gastrointestinal tract and probably in the liver.

There is a widespread flurry of activity to uncover new compounds which will possess such inhibitory effects with a minimum of toxicity. For these reasons we have devised this simple test, applicable to man, realising that further refinements in its application will be forthcoming and hoping that this type of procedure will place M.A.O.-inhibition therapy on a rational basis. It will also be interesting to determine whether there are disease states in which M.A.O. activity is impaired.

Section of Experimental Therapeutics and Laboratory of Clinical Biochemistry, National Heart Institute, National Institutes of Health, Bethesda, Maryland.

ALBERT SJOERDSMA
LOUIS GILLESPIE, JR.
SIDNEY UDENFRIEND.

* Synthesised and supplied by Lakeside Laboratories, Milwaukee, Wisconsin.

3. Waalkes, T. P., Sjoerdsma, A., Creveling, C. R., Weissbach, H., Udenfriend, S. *Science*, 1958, **127**, 648.
4. Freter, K., Weissbach, H., Redfield, B., Udenfriend, S., Witkop, B. *J. Amer. chem. Soc.* 1958, **80**, 983.
5. Udenfriend, S., Witkop, B., Redfield, B., Weissbach, H. To be published.
6. Spector, S., Prockop, D., Shore, P. A., Brodie, B. B. *Science*, 1958, **127**, 704.

CLEAN BLANKETS

SIR,—Because the sterilisation of woollen blankets, while preserving their natural properties, appeared to be impossible, attempts were made to devise a substitute. In view of the recent publicity in the Press this letter is written to inform your readers that a boilable bedcover with all the social properties of the conventional blanket is under trial. It has been found to be warm and comfortable, is easy to launder, handles well, is durable, and is reasonably cheap. Work is still in progress testing the effects of bactericidal chemicals and their carry-over after washing. It would be premature at this stage to give further details, for the blankets are not yet available in commercial quantities.

Nuffield Department of Surgery, University of Oxford.

J. S. CALNAN.

SIR,—Your leader of May 17 draws attention to the part played by woollen blankets in spreading infection in hospitals. It is now possible to obtain cotton blankets that give the same thermal insulation as wool at less weight and less expense. They can be sterilised and laundered by the methods used for other cotton articles.

This type of material was developed at the Shirley Institute, and was the subject of experiments on cross-infection in hospitals reported by Blowers, Potter, and Wallace.[1]

British Cotton Industry Research Association, Shirley Institute, Didsbury, Manchester.

H. M. TAYLOR.

THE MEDICAL DIRECTORY

The Editor of *The Medical Directory* writes:

"The annual schedule, upon the return of which the accuracy of *The Medical Directory* depends, has recently been posted to all traceable members of the medical profession, and its speedy return would be appreciated.

"A number of schedules, sent to a doctor's last known address, have been returned through the post office marked 'Gone Away'. Although in such cases every effort is made to find a new address, I should like to remind practitioners that if these efforts are not successful before the book goes to press, the names in question will be omitted from the next edition.

"Any doctor who has not received the annual schedule, or who has mislaid it and would like a duplicate, is requested to communicate as soon as possible with The Editor, The Medical Directory, 104, Gloucester Place, London, W.1. The full name and year of qualification of the doctor should be sent for identification, please."

Parliament

Prevalence of Bronchitis

ON July 9, on the adjournment, the Rev. LI.WELYN WILLIAMS drew attention to the fact that Britain has the worst record in the world for bronchitis. The death-rate was four times as high as that in the Ruhr or industrial Belgium, and about twenty times as high as that in the Scandinavian countries. In nearly all other countries the death-rate had fallen since the end of the war, but in Britain the position was substantially the same as in 1940 despite the introduction of new and powerful drugs. People often waxed indignant at the number of days lost through strikes, yet in 1956 industrial stoppages were responsible for the loss of 2 million working days while bronchitis was responsible for the loss of 25 million.

QUESTION TIME

Security Precautions at Broadmoor

Mr. MARCUS LIPTON asked the Minister of Health what action he would take to improve security precautions at Broadmoor.—Mr. WALKER-SMITH replied: The Board of Control has decided to hold an inquiry into the recent incident at Broadmoor Institution, and I must await its report. Mr. LIPTON: Will this inquiry be a full inquiry, in view of the widespread public misgivings caused by the recent escape? For example, will the inquiry take note of the unanimous view of the 230 male nurses in London, employed at Broadmoor, who have made urgent representations to the Minister that, from the security point of view, the Home Office should have some say in this matter?

Mr. WALKER-SMITH: This will be a full inquiry in the sense that it will inquire into all matters which are relevant and into which it is constitutionally proper for the Board of Control to inquire.—Mr. A. R. HURD: Will this be an independent inquiry such as the Scott Henderson inquiry?—Mr. WALKER-SMITH: This will not be an independent inquiry in the sense of the Scott Henderson Committee. I have already said that this is an inquiry by the Board of Control. It is an inquiry into this specific incident which is the first serious escape since the publication of the Scott Henderson findings in 1952. The procedures were reviewed by the Scott Henderson Committee. This is obviously a more narrow approach.

1. *Lancet*, 1957, i, 629.

Mr. R. T. PAGET: Will the Minister bear in mind the remarkable achievements in curing people by Broadmoor and not be panicked by this sort of thing into making medical treatment in Broadmoor impossible?—Mr. WALKER-SMITH: I have in mind these considerations as well as the conditions of security.

Shortage of Nurses

Mr. P. C. GOODHART asked the Minister how many beds in mental-deficiency units were out of commission in the South-East Metropolitan Regional Hospital Board area because of shortage of nursing staff. Mr. WALKER-SMITH replied: 230.

Mr. GOODHART: Is the Minister aware that the number of beds standing empty because of shortage of staff is nearly equal to the number of mental patients awaiting entrance to these units in this area?

Royal Commission on Remuneration

Mr. KENNETH ROBINSON asked the Minister whether the Royal Commission on Doctors' and Dentists' Remuneration had finished taking evidence; and when he expected to receive its report. Mr. WALKER-SMITH replied: The process of taking evidence and collecting necessary information will not be completed for some months, and, while the Commission intends to submit its report as quickly as possible thereafter, it does not expect to be able to do so until next year.

W.H.O. Malaria Fund

Mr. ARTHUR BLENKINSOP asked the Minister whether he would make a contribution to the World Health Organisation's malaria fund.—Mr. RICHARD THOMPSON, the parliamentary secretary to the Ministry, replied: It is not possible in present circumstances to supplement the contributions which we make to the regular budget of the World Health Organisation. We are in any case already making substantial contributions in this field. Mr. BLENKINSOP: Before the parliamentary secretary turns this down altogether, may I ask him to ask the Minister and the Chancellor of the Exchequer to look at the implications of this matter again, in view of the very high scientific advice which is available that this is a most urgent world problem and that we stand to gain from its solution as well as everybody else in the world?—Mr. THOMPSON: Yes, but we are opposed to the creation of special funds financed by voluntary contributions for organisations which are normally financed by compulsory assessment on member States.

Health Centres

Since the start of the National Health Service, local health authorities have established 9 health centres. 3 are under construction, and another will be started this year. 9 other schemes have been proposed, and 3 at least of these are likely to be started in 1959-60.

Mental Health Services

In the last financial year about 11½% of the total cost (about £585 million) of the National Health Service is identifiable as having been spent on mental health services. This includes 11% by hospitals (about 19¼% of their expenditure) and ⅓% by local health authorities (about 5½% of their expenditure). Certain administrative expenses of hospital authorities, which cannot readily be identified with individual hospitals, and the cost of beds for mental illness in acute hospitals, which cannot be separately ascertained, are not included. Similarly local health authorities incur some additional expenditure on mental health which is not separable from that on their other services.

Carbromal and Bromvaletone

The Poisons Board, at its meeting on June 18, decided that the evidence before it was insufficient to warrant any change in its recommendation of 1955 that preparations containing carbromal, or carbromal and bromvaletone, should not be controlled under the Poisons Act. The Home Secretary has accepted this recommendation. The Minister of Health proposes, however, at the suggestion of the Board, to invite the committee on drug addiction, recently set up under the chairmanship of Sir Russell Brain, to examine further the risks attending the abuse of such preparations.

Obituary

ISIDOR CLINTON RUBIN

M.D. Columbia

SOME of the finest ambassadors have no ambassadorial rank, and Dr. Rubin, the distinguished American gynæcologist, who died in London on July 10, was a member of this small band of world citizens; for by his vision, warm sympathy, gentle culture, and manner of living he denied the artificial bounds of race, colour, and political dogma.

He studied medicine in New York and became an M.D. of Columbia University in 1905. He worked at Mount Sinai Hospital from 1905 to 1909 with Dr. H. N. Vineberg, who advised him in 1909 to go to Vienna for further study. There Rubin came under the influence of Professor Schottlander, pathologist to the University Frauenklinik, who introduced him to laboratory methods of scientific work and helped him to prepare his first papers. In 1910, on his return to the United States, Rubin was appointed gynæcologist at the Beth Israel Hospital, and in 1929 he became director of the gynæcological service there. From 1937 to 1947 he was clinical professor of gynæcology at Columbia University, and from 1948 clinical professor of obstetrics and gynæcology at New York University.

He was honoured in many countries. In 1955 he was made an officer of the French Legion of Honour, and the Royal College of Obstetricians and Gynæcologists of Great Britain made him an honorary fellow in 1957. He was a familiar figure at congresses all over the world, and he was a welcome visitor to the last British Congress of Obstetrics and Gynæcology, held at Oxford in 1955.

Rubin will perhaps be best remembered for his work on tubal insufflation, of which J. A. S. writes:

It was in 1914 while he was working in the laboratory of Wertheim at Vienna that Dr. Rubin first became interested in the demonstration of the uterus and tubes by radiological methods. He injected 'Collargol' into the postmortem human uterus and into the uterus of living rabbits. He was quick to realise the possibility of diagnosing submucous fibroids by this technique and he saw that with this new method it would be possible to demonstrate tubal patency in the living by the use of radio-opaque solutions. Collargol was not adopted in practice because of toxic side-effects, but later, when 'Lipiodol' was developed, the technique of hysterography and salpingography became a routine procedure in fertility testing. Rubin then realised the possibility of using gas to demonstrate tubal patency, and in 1919 at Mount Sinai Hospital in New York he performed his first uterotubal insufflation. His many subsequent papers chronicle the developments and improvements of this technique, the carefully laid-down criteria for its safe performance, and analyse critically the results achieved. His interest in this problem was much deeper than many have appreciated, for he was not engaged in merely demonstrating tubal patency. He was interested above all in function. His work threw much light on tubal function from anatomical, physiological, pharmacological, and clinical points of view. He demonstrated the relation between tubal function and the hormonal factors of the menstrual cycle. He tested and recorded the pharmacodynamic influence of various drugs on the uterus and tubes. However encouraging the results, Rubin was always searching for something better, and until the day of his death he was still investigating the ideal radio-opaque medium for use in radiological investigations of the genital tract.

His published papers show the breadth of his interest. Like Bonney, he was a firm believer in conservative techniques when these could be employed without hazard to the patient. He was an advocate of myomectomy instead of hysterectomy

during the childbearing years. He was keenly interested in the problems of pelvic pain, dysfunction due to autonomic factors, and the influence of hormones on the genital tract, and in the importance of gynæcological pathology. He has been justly described as a prolific writer. More important, however, is the fact that his contributions were all examples of clear thought and concise expression. His collected papers, from 1910 to 1954, were published privately in 1954, and those who have read the collection will have been impressed by the generous tributes paid to him in the three forewords by distinguished colleagues from three different countries: Dr. Emil Novak from Johns Hopkins, Dr. Axel Westman from Stockholm, and Dr. Bernard Zondek from Israel, all wrote simply and sincerely of his high scientific integrity, of his modesty, of his profound culture and noble character, and of those social graces which made him such a delightful companion.

Dr. Rubin was an outstanding surgeon and a great man much beloved. We mourn his passing but are grateful for his life and work.

CYRIL JOHN MORGAN

M.B., B.Sc. Wales, D.P.M.

Dr. Morgan, consultant psychiatrist and medical superintendent of Morgannwg Hospital, Bridgend, Glamorgan, died on June 26 at the age of 42.

He was born at Penydarren, Merthyr Tydfil, Glamorgan, and he was educated at Cyfarthfa Grammar School, Merthyr, and at the Welsh National School of Medicine in Cardiff, where he graduated B.SC. in 1936 and M.B. in 1939. After holding a resident appointment at Pontypool Hospital he joined the R.A.M.C., and served as a psychiatrist in this country and in West Africa until he was demobilised in 1945. The same year he joined the staff of the Rainhill Hospital, Liverpool, where he became senior medical officer. He took the D.P.M. in 1947, and in 1949 he was appointed deputy medical superintendent at Morgannwg Hospital, Bridgend. He became medical superintendent four years ago. He leaves a widow and three young sons.

M. D. A. writes:

Cyril Morgan was a truly dynamic personality, and he will ever live in the memory of all who knew him for his innate kindliness, his ever ready help, his seemingly tireless energy, and his infectious enthusiasm. He was a brilliant and stimulating conversationalist, and had an exceedingly wide range of interests.

ANDREW MEARNS FRASER

M.D. Edin., D.P.H.

Dr. Mearns Fraser, who was medical officer of health for Portsmouth from 1896 to 1934, died on July 8 in the Royal Portsmouth Hospital at the age of 90. To the older generation of public-health doctors his name will bring back memories of a man of outstanding ability and great personal charm.

He was born at Reading and educated at the City of London School and at the University of Edinburgh, where he graduated M.B. in 1893. Two years later he took the D.P.H. and joined the staff of the Essex County Council as assistant M.O.H., and he held this post until he moved to Portsmouth in 1896.

H. C. M. W. writes:

During the expansion of the health services in the early part of the century Mearns Fraser was one of the pioneers in the development of the tuberculosis service, and he established one of the first of the tuberculosis dispensaries, which was known in Portsmouth as the "tuberculin dispensary." After the 1914–18 war he took an active part in the campaign to check the dissemination of venereal diseases. At that time he met with a great deal of opposition in his advocacy of the use of potassium permanganate as a prophylactic because it was thought that this would lead to promiscuity. Apart from organising efficient local clinics and other services he supported many national bodies associated with preventive medicine. He was a member of the council of the Society of Medical Officers of Health, of the departmental committee set up by the Local Government Board in 1912 on the future national policy to combat tuberculosis, and of the departmental cancer committee.

When he retired in 1934 the regard and affection in which he was held by his staff and the people of Portsmouth was shown by the many tributes and presentations made to him. He retired to Hayling Island close to the golf course, so that he might enjoy to the full his well-earned years of retirement in a place that offered all the facilities for his favourite recreation. His many friends were delighted that he was still playing up to two to three years ago.

Dr. Mearns Fraser leaves a widow and two daughters.

Sir ARNOLD STOTT

H. S. C. S., who with Stott was one of a trio who worked and played together from their last years at Cambridge till the end of their house-appointments at Barts, writes:

Arnold was really very consistent once it was grasped that his true period was the late 18th or early 19th century, when society was still essentially aristocratic. Medicine he made his chief and therefore very successful hobby, but he might have been equally outstanding in the cotton world of Manchester, and probably ended his career as lord lieutenant of the county. He was the most generous and kindhearted of men, but simple little remarks, really thinking aloud and uttered in his cool deliberate voice, which were the delight of his friends, sometimes had a devastating effect on those who only knew him slightly. At our last meeting at the Fountain Club shortly before his retirement, which we were discussing, he remarked suddenly, "One thing really distresses me. People so often seem afraid of me. Why is it?" and it was a great shock to think that perhaps with his seniority that could be possible though well-nigh incredible.

By his transfer from Barts to Westminster the latter hospital had the great good fortune to acquire one of the last of the "vintage" physicians.

Appointments

CAIRNS, J. G., M.B. Glasg., D.P.H.: M.O.H., Halifax.

CAPSTICK, A. L., M.B., B.SC. Wales, D.P.M.: assistant psychiatrist (S.H.M.O.), Whitchurch Hospital, near Cardiff.

DONOVAN, J. F., M.R.C.S., D.P.M.: medical superintendent, St. Lawrence's Hospital, Bodmin, Cornwall.

GARFIT CLOWES, LOUISE M. E., M.B. Belf., D.P.H.: assistant M.O., Surrey.

LATHAM, ALICE, M.B., B.SC. Wales, D.OBST., D.C.H.: assistant M.O., Surrey.

ROBERTS, T. E., M.B. Lond., D.OBST., D.P.H.: deputy M.O.H., High Wycombe and Marlow, and assistant M.O. and school M.O., Buckinghamshire.

SPARROW, OLIVE M., M.D. Lond.: assistant M.O., Haltemprice, near Hull.

SPENCER, S. J. G., D.M. Oxon., D.P.M.: consultant psychiatrist, Digby-Wonford Hospital, Exeter.

ZALIN, HAROLD, M.B. Lpool, F.R.C.S.E., D.L.O.: part-time consultant E.N.T. surgeon, Walton Hospital, Liverpool.

The Hospital for Sick Children, Great Ormond Street, London:

CORLETT, KEITHA, M.B., N.Z., M.R.C.P., D.C.H.: house-physician.

LEADER, LESLEY P., M.B., B.SC. Lond., M.R.C.P.: house-physician.

MUNRO, A. I., M.B. Lond.: house-surgeon.

WESTON, H. J., M.B. N.Z., M.R.C.P., D.C.H.: resident assistant physician.

WILSON, P. E., L.R.C.P.I., D.P.H.: assistant medical registrar.

Newcastle Regional Hospital Board:

DAYAN, ELIA, M.B. Cairo, F.R.C.S.: senior casualty officer, South Shields group of hospitals.

DUTTON, J. E. M., M.B. Durh., F.R.C.S.: consultant neurosurgeon, Sunderland hospital group and regional neurosurgical service.

HENDERSON, C. B., M.D. Durh., M.R.C.P.: consultant cardiologist, regional cardiovascular unit, Newcastle General Hospital, and regional thoracic surgery centre, Shotley Bridge General Hospital.

ISMAY, GEOFFREY, M.D. Durh., M.R.C.P.: consultant general physician, south west Durham and Durham hospital groups.

MARSHALL, MERLIN, M.B. Cantab., F.F.A. R.C.S.: consultant anæsthetist, Newcastle upon Tyne hospital group.

NEAL, F. E., M.B. Sheff., D.M.R.T.: assistant radiotherapist (S.H.M.O.), regional radiotherapy service.

WELCH, B. G., M.D. Lond., M.R.C.P.: consultant pædiatrician, Hartlepools and Tees-side hospital groups.

Notes and News

WORK OF THE KING'S FUND

AT the sixty-first annual meeting of King Edward's Hospital Fund for London on July 10, the Duke of Gloucester, the president, said that the Fund's grants had provided improvements of many kinds. Very many hospitals showed the results of the Fund's grants to provide better living conditions for the nurses. To build a recreation hall was often too large an item to be met by any other means than a grant from the King's Fund; and the Fund had now given a number of such halls, as well as making many improvements in nurses' homes. At present there was a great need in some hospitals for better arrangements for the increasing number of staff who were non-resident, and the Fund had made grants to provide changing-rooms and sitting-rooms for them. The Duke referred to the great difference that might be made to the quality of the future hospital service by various training schemes financed by the Fund. The work of the three staff colleges—for ward sisters, for hospital administrators, and for future matrons—as well as the School of Hospital Catering, had led to results which were no less real.

Lord Ashburton, the treasurer, moving the adoption of the accounts, said that last year for the first time the Fund's income had exceeded £400,000. This included a further instalment of £50,000 from the Nuffield Trust for the Special Areas. In all the King's Fund had distributed more than £16 million to the hospitals of London, and still held a capital of over £7 million.

INSTITUTE OF MEDICAL LABORATORY TECHNOLOGY

FOR the fourth time in fifteen years, this institute has moved to larger premises because of the growth in its membership and commitments. Its new headquarters at 74, New Cavendish Street, Harley Street, London, W.1, were acquired at the end of last year and were occupied in May. At the house-warming on July 2, Prof. E. T. C. Spooner, the president, received many pathologists who are honorary fellows of the institute, in addition to several past and present officers and others closely associated with its work.

The voluntary Association which was the forerunner of the present institute took some thirty years to reach a total of 1000 members, which was its strength when the institute was incorporated in 1942. The increase to nearly 7000 members today is an indication of the expansion of the pathology services.

University of Oxford

On June 26 the following degrees were conferred:

D.M.—S. J. G. Spencer.
B.M.—Colin Bell (in absentia).

University of Cambridge

On June 25 the degree of B.CHIR. was conferred on the following:

A. R. Adamson, D. I. Atkinson, J. S. Bailey, P. J. Ball, J. E. Banatvala, Michael Barry, J. R. Bartlett, Anne C. Bayley, P. J. Beale, D. L. Belcher, P. M. J. Bennett, D. A. Birkett, John Blake, S. S. Bleehen, Shirley A. Bolt, P. D. G. Briggs, G. C. Brill, M. H. Brooke, E. P. Brooks, F. T. Brough, J. M. Brown, Margaret U. Bullen, H. P. R. Bury, W. D. Callum, I. G. Carnegie Brown, C. J. Carr, I. R. Carr, Ian Chippendale, P. W. Clements, R. D. Cohen, M. J. Corrigan, A. D. Crawford, J. R. B. Currie, Derek Davies, G. M. Davies, M. H. Davies, Nerys Davies, Clare E. Durrant, A. J. Earl, J. S. Elkington, R. M. M. Fordham, P. B. Garland, T. W. Gibson, J. E. Godrich, R. J. M. Gold, R. B. Harcourt, J. D. Hardcastle, N. A. Harker, D. C. Harvey, W. R. Heaton, John Hedley-Whyte, A. A. Hooper, J. R. Holye, Yvonne P. Humphreys, I. D. Hunter-Craig, R. K. Jackson, J. D. Jeremiah, Mr L. Johnson, R. H. Johnson, Audrey E. Kermode, R. A. Kipping, C. G. Koo, J. R. Langmaid, N. K. Leiper, P. O. Liebling, R. M. Lodge, J. W. Mack, R. J. Mitchell, Tony Moreton, H. G. Morgan, M. G. E. Morgan, Brian Newbigin, N. W. Oakley, M. J. O'Shea, J. D. Owen, J. S. Paddle, P. W. S. Patton, E. N. Payne, P. V. Pigott, G. E. T. Raine, M. J. Ramsden, M. J. Raphael, R. J. Read, Allan Reynolds, J. C. Rice, A. B. Richards, Brian Richards, D. J. Richards, Valautham Rudralingam, Heather M. Rumsey, Nanju Sankarayya, D. C. L. Savage, W. G. Shakespeare, J. M. Shepherd, Margaret R. Skelton, A. C. Smith, T. A. L. Smith, J. W. Soper, J. C. Southam, J. E. Stark, J. M. Stephenson, S. O. Suite, A. J. Taylor, M. E. Tuck, H. B. Valman, Mary Walker, Daphne M. Ward, D. B. Watkin, John Weston, W. F. Whimster, D. M. Whiteford, Alan Whitworth, D. H. Whyte-Venables, M. E. Wilson, F. G. de L. Wright, Richard Yeo.

University of London

AT recent examinations the following were successful:

D.T.M. & H.—A. H. Nasr.
D.P.H.—J. A. R. Anson, A. J. Barwood, Anand Bhoomkar, G. Castle, Elizabeth P. Cloake, W. G. Cooke, Elizabeth J. Coulter, W. E. Crocker, Evelyn C. Cummings, L. A. C.-R. C. da Motta, W. R. Davies, Margaret Duncan, Bernard Gampel, A. K. Gupta, D. F. Hadman, Thomas Hall, D. R. Haupt, A. J. Hibell, E. G. Larson, Huan-Ying Li, P. G. W. A. Lommerse, Christopher Lydon, R. W. McCollum, W. H. McDonald, H. F. McElligott, W. R. McKibben, J. A. McKinnon, C. J. H. Mann, Ann B. Marples, Machupe Mphahlele, Rudolf Neumann, Satya Ranjan Ray, T. H. Redfern, J. H. Sewart, Henry Shore, E. R. Simpson, J. J. Slome, L. S. Sodhy, R. H. Strudwick, David Sturman, S. V. Tamhane, G. S. Udall, J. de M. Vink, M. W. L. White, R. E. Woolley, J. R. R. Wray.

University of Birmingham

On July 4 Prof. A. Lacassagne, of the Pasteur Institute in Paris, opened clinical research laboratories at the Medical School. The laboratories, which have cost £50,000, were provided by the Birmingham branch of the British Empire Cancer Campaign.

They are situated on the site reserved for clinical research near the Queen Elizabeth Hospital and the Medical School at Edgbaston. The laboratories will permit all cancer research in Birmingham to be centred in one place. Dr. John Orr, professor of pathology in the university and director of cancer research, has been closely concerned with the project. After Professor Lacassagne had declared the laboratories open, Prof. L. Severi, of the University of Perugia, unveiled a plaque commemorating the work of Sir Gilbert Barling, the first chairman of the Birmingham branch of the British Empire Cancer Campaign. A second plaque, commemorating a gift of £30,000 from Alfred and Ruth Bullock towards the cost of the laboratories, was unveiled by Dr. O. Muhlbock of the Dutch Cancer Institute, Amsterdam.

University of Durham

On July 4 and 5 the following degrees and diplomas were conferred:

M.D.—G. S. Anderson, *Gordon Pringle, *G. A. Stirling.
M.B., B.S.—John Anderson, W. V. Anderson, Margaret S. Atkins, Judith C. H. Bullen, Margaret S. Burrill, Mary Bynon, *P. M. Calamel, I. G. Campbell, John Cape, Jean Carr, Ben-Zion Chalk, J. R. Cox, W. G. Donald, C. M. Dunn, L. E. Dunn, Elizabeth Elliott, M. A. Ferri, Gerald Gill, C. P. Gillie, H. L. Goldwater, Ronald Heslop, D. H. Irvine, Fiona M. Lehmann, Margaret A. Lewis, Thomas Lind, J. B. McCafferty, A. J. McComas, C. H. McCulloch, Alastair Malcolm, P. F. Moran, J. M. Morrison, H. N. Murray, Harald Natvig, Sarah H. J. Nelson, S. A. Oduntan, I. L. T. Oluwole, Alan Poweny, D. G. Proudler, D. N. Raine, Donald Rankin, M. F. Reece, Ernest Ross, Dorothy A. Stevenson, J. R. C. Stubbs, Margaret A. Stubbs, Ernest Taylor, I. H. Taylor, Stanley Tetlow, Jean B. Thompson, P. R. Uldall, Michael Ward, Joan M. Whitmore, P. G. Wood, P. H. Yorke.
* In absentia.
D.P.H.—Jean M. Bainbridge, Florence Cadogan, Marion Harrison, T. W. L. Knaggs, June K. Lloyd, R. T. Pagan, Doris Story.
D.P.M.—Edmond Stanley Lower.

University of Liverpool

Dr. W. E. Kershaw has been appointed to the Walter Myers and Everett Dutton chair of parasitology and entomology, on the retirement of Prof. R. M. Gordon.

Dr. Kershaw, who is 47 years of age, graduated M.B. from the University of Manchester in 1935, and four years later was awarded a junior research fellowship in tropical medicine with the Medical Research Council. During the late war he served with the R.N.V.R. at sea and later as pathologist to the Royal Naval Auxiliary Hospital in Ceylon. In 1946 he was appointed lecturer in medical parasitology in the Liverpool School of Tropical Medicine. In 1949 he took the degree of M.D. with commendation. He was awarded the Chalmers medal of the Royal Society of Tropical Medicine and Hygiene in 1955, and the following year graduated D.SC. Last year he was appointed Leverhulme senior lecturer in parasitology at the school. He has made annual visits to the Cameroons and Nigeria for some years in connection with the helminthiasis research scheme of the Colonial Medical Research Council, and he represented the school at the World Health Organisation conference on onchocerciasis at Leopoldville in 1954.

University of Glasgow

ON June 18, the D.P.H. was awarded to the following:

R. E. Atkinson, D. B. Campbell, W. MacD. Campbell, A. J. Childs, Margaret J. Devine, D. E. Donald, Margaret E. Forbes, G. S. Henderson, A. S. L. Kennedy, J. E. Lunn, Marion T. Lunn, Archibald McCutchion, Sheila Macintyre, J. B. Morris, W. M. Prentice, Frank Slane, A. McI. Tait.

National University of Ireland

Dr. D. K. O'Donovan has been appointed to a senior professorship of medicine and Mr. Patrick Fitzgerald to a senior professorship of surgery at University College, Dublin.

Royal College of Surgeons of England

At a meeting of the council held on July 10 Sir James Paterson Ross was re-elected president of the college. Sir Archibald McIndoe was re-elected, and Mr. A. Dickson Wright was elected, vice-president. Dr. Warren H. Cole, of Chicago, and Dr. Charles W. Mayo, of Minnesota, were admitted as honorary fellows. Dr. H. J. Windsor, of Brisbane, was admitted to the fellowship, as a member of 20 years' standing. A diploma of fellowship was granted to R. M. Wagh.

Dr. Geoffrey Organe was coopted to the council as a representative of anæsthetics. Dr. Ivan Magill, Dr. R. J. Minnitt, Dr. E. S. Rowbotham, Sir Henry Souttar, and Dr. R. M. Waters were elected honorary fellows in the Faculty of Anæsthetists.

The following lecturers were elected for the coming year:

Hunterian professors.—W. E. Tucker, traumatic syndrome phases and stages; R. A. Mogg, congenital anomalies of the urinary tract; E. M. Nanson, tumours of the parotid gland; J. B. Curtis, subarachnoid hæmorrhage and intracranial aneurysms; C. J. Kaplan, conservative therapy in skeletal tuberculosis; P. H. Jones, lobectomy and bronchial anastomosis in the surgery of bronchial carcinoma; G. J. Hadfield, hormone deprivation in breast cancer; A. G. Parks, microanatomy of the breast; T. J. S. Patterson, congenital deformities of the hand; J. W. Dickson, pathological ossification in nervous disease; Cyril Harvard, non-malignant bile-duct obstruction; A. J. Davies, carcinoid tumours; G. S. M. Botha, the closing mechanism between stomach and œsophagus and its importance in surgery of the gastroœsophageal junction; J. S. Calnan, surgical treatment of speech disorders.

Arris and Gale lecturers.—E. R. Smith, anatomy and physiology of the bile and pancreatic ducts; G. L. Bourne, anatomy, physiology, and pathology of the human amnion and chorionic membranes; K. M. Backhouse, the gubernaculum testis Hunteri, testicular descent, and maldescent.

Erasmus Wilson demonstrators.—Richard Goodbody, K. M. Laurence, L. W. Proger, R. C. B. Pugh, H. A. Sissons, M. A. Skelton.

Arnott demonstrators.—Jessie Dobson, A. A. Barton, Alan Howe, R. J. Last, R. M. Livingston, Bertie Cohen.

Buckston Browne dinner.—At this dinner on July 9 the toast of The College was proposed by Mr. Derek Walker-Smith, Minister of Health, who laid stress on the importance of a positive approach to the health and wellbeing of the nation and especially the industrial population, as a means of improving the general standard of life. Sir James Paterson Ross, the president, emphasised in his reply that research has a direct application to the practice of medicine and the alleviation of disease; it is like a tree with many branches. Sir Archibald McIndoe welcomed The Guests, among whom were many leaders of the medical and industrial worlds. Responding, Sir Harry Jephcott spoke of the college's worldwide reputation and of its valuable contribution to public as well as medical work.

Royal College of Physicians of Ireland

On July 4 the following were admitted to the licentiateship of the college:

J. A. Aziz, G. O. Balogun, G. A. Bharmal, N. P. Boyle, D. C. P. Brown, J. J. V. Caraher, F. B. A. Coker, D. P. Connolly, Josephine P. Cummins, D. A. F. Doherty, J. F. Doyle, P. A. Egbe, M. J. Fennell, J. G. A. Fitzgerald, Eithne M. A. Flood, Gabriel Blankson-Hemans, J. T. Hogan, Mary C. Horgan, O. G. L. Hunter, J. H. Jackson, A. M. Jeeva, Mary J. Keating, Mary P. R. Kenny, N. M. N. Lamki, Trevor Morgan, Jack Mullins, J. F. X. McGlade, Ina L. McGregor, Peter McLean, P. R. P. Naidu, B. R. O'B. Nation, M. J. Noronha, Catherine O'Connor, Eamon O'Daly, C. M. Omarjee, R. J. Osborne, Mary Owens, Richard Quirke, S. D. Ram, D. F. Reynolds, Dolly T. Salami, S. K. Suleman, Dzintars Svenne, J. B. Swan, W. H. Twedell, T. R. Vij, P. B. Vilain, F. G. Walls, L. A. G. Wharton, L. R. L. Whitelocke, T. A. Worth, Paul Zamick.

Society of Medical Officers of Health

Scottish Branch.—Dr. I. A. G. MacQueen has been elected president.

Chartered Society of Physiotherapy

This society will hold its annual conference at Bristol from Sept. 11 to 13. The society welcomes doctors to any of the lectures, and complimentary tickets may be had from the registration secretary, physiotherapy department, Bristol Royal Infirmary.

Fellowships at the University of Rochester

Buswell fellowships are offered to medical graduates for research in any department of the school of medicine and dentistry. Graduates of British medical schools are eligible.

Junior fellowships will be awarded to medical graduates who have completed at least one year of internship or equivalent training. Research experience is not required but will be of advantage, since fellows are expected to spend about 90% of their time in research or in advanced study in preparation for research. They provide a basic stipend of $4500 to $6000 a year and may be renewed with increments for a second or third year. An additional $350 a year may be provided for each dependent.

Senior fellowships will be awarded to medical graduates who have held a junior fellowship for two or three years or have had comparable experience in medical research and wish to continue in an academic career. They will provide a basic stipend of $5500 to $8000 a year, with provision for annual increments and dependants.

Applications will be received at any time, and forms may be had from Dr. L. E. Young, University of Rochester Medical Center, 260, Crittenden Boulevard, Rochester 20, New York.

College of General Practitioners

Public Welfare Foundation Prize Competition 1958.—The college will award six prizes of £40 in a competition open to senior students of all medical schools in the United Kingdom and Eire. The closing date for entries is Aug. 1, and application forms may be had from deans of medical schools or from the college, 41, Cadogan Gardens, London, S.W.3.

Postgraduate Medical School of London

A symposium, for consultant physicians, on rheumatic fever and rheumatic heart-disease will be held from Sept. 22 to 25 at the school, Ducane Road, W.12, and at the Canadian Red Cross Memorial Hospital, Taplow, Bucks. The fee for the course is £4 4s. and applications should be made by Aug. 14 to the dean of the school.

International Congress of Leprology

This congress, which was to have been held in New Delhi, is now to meet in Tokyo on Nov. 12 under the sponsorship of the Japanese Leprosy Foundation and the International Leprosy Association. The secretary of the association (8, Portman Street, London, W.1) asks all who will be able to attend the congress in its new location to let him know at once.

Roehampton Courses on Artificial Limbs

The next courses on artificial limbs and rehabilitation after amputation for orthopædic surgeons will be from Oct. 13 to 17 inclusive, and the next for specialists in physical medicine on Oct. 29 and 30. Those interested should apply to the Principal Medical Officer, Artificial Limbs and Appliances Centre, Roehampton House, London, S.W.15.

Diary of the Week

JULY 20 TO 26

Tuesday, 22nd

SOCIETY FOR THE STUDY OF ADDICTION
8 P.M. (11, Chandos Street, W.1.) Mijnheer H. J. Krauweel (Amsterdam): Incidence and Treatment of Alcoholism in the Netherlands.

Wednesday, 23rd

POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.12
2 P.M. Dr. Janet Niven: Cytopathological Aspects of Latent Infection.
INSTITUTE OF CHILD HEALTH, Hospital for Sick Children, Great Ormond Street, W.C.1
5 P.M. Dr. Willis J. Potts (Chicago): Congenital Atresia of the Œsophagus. (Alex Simpson Smith lecture.)

Thursday, 24th

WEST LONDON HOSPITAL MEDICAL SCHOOL, Hammersmith, W.6
5 P.M. Mr. Harold Burge: Problems in Gastric Surgery. (Alex Simpson Smith lecture.)

Friday, 25th

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.2
4.30 P.M. Dr. Potts: Respiratory Emergencies in the New Born. (Moynihan lecture.)
ROYAL COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS, 58, Queen Anne Street, W.1
5 P.M. Mr. James Black (Johannesburg): Reminiscences of Fifty Years' Medical Practice—Forty-Seven of Them in South Africa. (William Meredith Fletcher Shaw lecture.)

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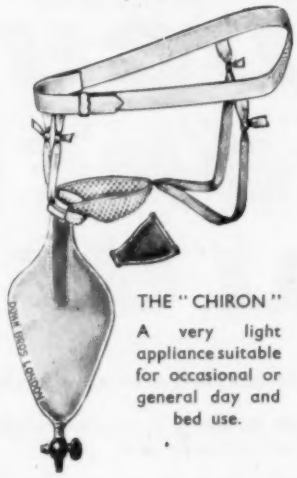

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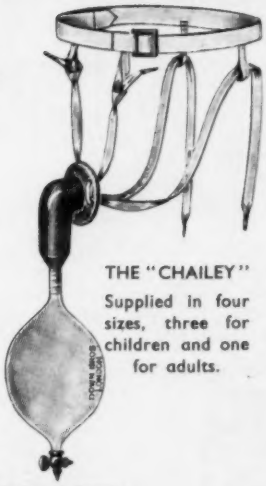

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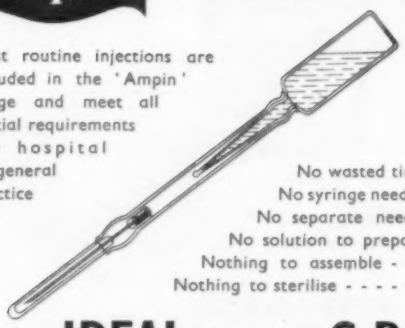

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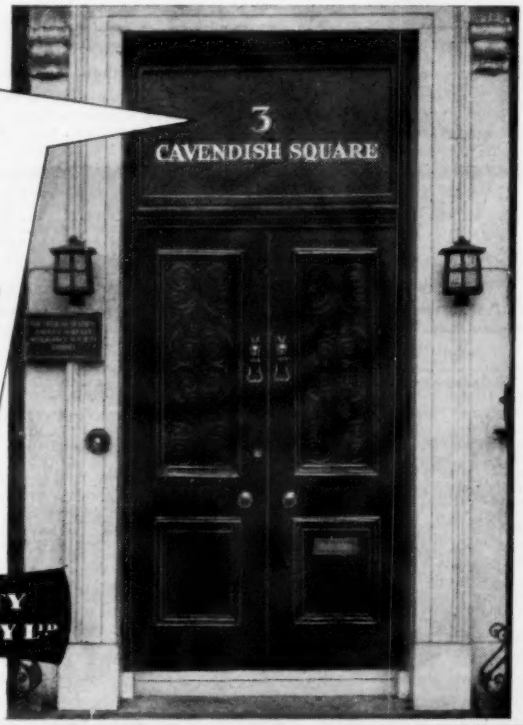

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The Terms and Conditions of Service of Hospital Medical and Dental Staff apply to all N.H.S. hospital posts we advertise, unless otherwise stated. Canvassing disqualifies, but candidates may normally visit the hospital by appointment.

Academic and Educational

ASSOCIATION FOR THE STUDY OF MEDICAL EDUCATION

The FIRST CONFERENCE of the Association will be held in London at the Royal College of Physicians on THURSDAY and FRIDAY, 25TH and 26TH SEPTEMBER, 1958.

The title is : "Experiment in Medical Education."

The programme will be :—

Thursday, 25th September, 1958

A.M. In the Chair—Professor ROBERT PLATT.
10.00. Opening Address—Sir RUSSELL BRAIN, Bart.
The Study of Medical Education in the United States of America—DR. G. P. BERRY (Harvard).
The Study of Medical Education in Britain—Professor Sir GEORGE PICKERING (Oxford).
Discussion.
P.M. In the Chair—Professor Sir JAMES PATERSON ROSS.
2.00 The Study of Students—DR. N. MALLESON (University College).
Discussion.
Examinations—Professor G. M. BULL (Queen's University, Belfast).
Discussion.
Teaching of Social Medicine—DR. J. N. MORRIS (Medical Research Council).
Discussion.

Friday, 26th September, 1958

A.M. In the Chair—DR. J. G. MCCRIE (Sheffield).
10.00. Medical Education at Western Reserve University—Professor T. HALE HAM.
Discussion opened by Professor G. A. G. MITCHELL (Manchester) and Professor W. M. ARNOTT (Birmingham).
P.M. In the Chair—Sir RUSSELL BRAIN, Bart.
2.00. The New Swedish Curriculum—Professor B. REXED (Uppsala).
Discussion opened by DR. J. R. ELLIS (London).

The Annual General Meeting of the Association will be held at 5 P.M. on FRIDAY, 26TH SEPTEMBER.

The Registration fee will be £3 3s. inclusive of lunches and teas.

A Dinner will be given by the Royal College of Physicians for those attending the conference—and will be held on FRIDAY, 26TH SEPTEMBER, day dress, at 7.00 for 7.30 P.M. in the College.

Applications, with cheque for £3 3s., should be sent in as soon as possible, as numbers may have to be limited, and certainly not later than 6th September, 1958.

Applications to attend the conference (which is open to members of the Association and others) should be sent to : J. R. ELLIS, Esq., M.B.E., M.D., F.R.C.P., Honorary Secretary, Association for the Study of Medical Education, at The Royal College of Physicians, Pall Mall East, London, S.W.1.

UNIVERSITY OF CAMBRIDGE

PINSENT-DARWIN STUDENTSHIP

The Managers hope shortly to elect for 1 year in the first instance to a STUDENTSHIP IN MENTAL PATHOLOGY of the value of £700. The student must engage in original research into any problem having a bearing on mental disorder or defect.

Applicants should write before 28th July to the Secretary, Pinsent-Darwin Studentship, Department of Medicine, Tennis Court-road, Cambridge, stating their age and qualifications and the general nature of the research that they wish to undertake.

UNIVERSITY OF DURHAM

THE MEDICAL SCHOOL, KING'S COLLEGE, NEWCASTLE UPON TYNE

DIPLOMA IN PSYCHOLOGICAL MEDICINE

A PART-TIME COURSE in Anatomy and Physiology of the Nervous System and in Psychology for Part I of the Diploma in Psychological Medicine, will begin in OCTOBER, 1958. Instruction will occupy 2 days a week during the Michaelmas and Epiphany Terms. The fee for the course will be £20.

A PART-TIME COURSE in Psychiatry and Neurology for Part II of the Diploma will also begin in OCTOBER, 1958. Instruction will occupy 2 days a week and will be spread over the period OCTOBER, 1958–SEPTEMBER, 1959. The fee for the course will be £40. The examination for Part II will be held in SEPTEMBER, 1959, and successful candidates should be able to enter for Part II and qualify for the Diploma in MARCH, 1960.

As from OCTOBER, 1959, the course for Part II will be held on 2 days a week for 4 academic terms. Candidates entering the course in OCTOBER, 1959, should be able to sit the qualifying examination for the Diploma in DECEMBER, 1960.

Arrangements can be made for candidates who have held resident appointments for 6 months at a recognised hospital for mental diseases to complete the requisite clinical experience during the course.

Application forms, copies of the regulations and syllabus, together with further particulars, including information regarding study leave arrangements agreed with the Newcastle Regional Hospital Board, can be obtained from the Assistant Registrar, Medical School, King's College, Newcastle upon Tyne, 1.

THE UNIVERSITY OF MANCHESTER. Darbishire HOUSE HEALTH CENTRE. Applications are invited for the appointment of ASSISTANT GENERAL PRACTITIONER at the Darbishire House Health Centre in Upper Brook-street and High-street, Manchester, for a period of 12 months beginning 1st October, 1958. The work entails assisting the 4 General Practitioners in the Centre in which about 12,000 patients are at present registered. The Health Centre is also used in the teaching of medical students of the University. Salary at the rate of £1050 p.a., with an allowance towards the cost of travelling expenses and superannuation.

Applications, which should include full particulars of qualifications and experience, must reach the Registrar, The University, Manchester, 13, not later than 9th August, 1958, and should give the names of not more than 3 persons to whom reference may be made.

GUY'S HOSPITAL MEDICAL SCHOOL, S.E.1. Applications are invited for the post of JUNIOR LECTURER or LECTURER in the Department of Bacteriology commencing on 1st October, 1959. Applicants should have a scientific or medical degree and those with experience in biochemical techniques and with an interest in microbiological research will be preferred. Initial salary according to qualifications and experience in the range £850 p.a. plus £60 London allowance, to £1150 p.a., with superannuation and family allowance.

Application should be made not later than 26th July, 1958, on a form obtainable from the Dean.

UNIVERSITY OF BIRMINGHAM. Faculty of Medicine. Applications are invited for the post of Whole-time LECTURER IN MEDICINE (clinical) with clinical duties in the Medical Professorial Unit of the Queen Elizabeth Hospital. There are opportunities for research into problems of cardio-respiratory function. Salary range £900–£1950 (plus F.S.S.U. and family allowance), depending on age, experience and qualifications.

Applications (9 copies), together with the names of 3 referees, should be sent not later than 26th July, 1958, to the Assistant Registrar, The Medical School, Birmingham, 15, from whom further particulars may be obtained.

UNIVERSITY OF CAMBRIDGE. Department of Medicine. Applications are invited for the post of ASSISTANT IN RESEARCH IN MEDICAL PSYCHOLOGY, to begin duties on 1st October, 1958, or as soon as possible thereafter. The person appointed, who should have a registered medical qualification, will be required to engage in clinical and experimental research under the direction of the Reader in Medical Psychology. Pensionable stipend is on the scale £650–£25–£850, the appointment being for a year in the first instance.

Further information may be obtained from Dr. D. A. GRESHAM, Secretary of the Appointments Committee of the Faculty of Medicine, The Medical School, Tennis Court-road, Cambridge, to whom candidates should send 10 copies of their application, with the names of not more than 3 referees, to reach him not later than 28th July, 1958.

THE UNIVERSITY OF LEEDS. Department of Surgery. Applications are invited for appointment as LECTURER IN SURGERY at a salary on the scale £1200–£100–£1600 (efficiency bar)–£100–£1900 a year, according to qualifications and experience. The salary may rise to a higher maximum in the case of a Lecturer with direct responsibility for patients.

Applications (3 copies), stating date of birth, qualifications and experience, together with the names of 3 referees, should reach the Registrar, The University, Leeds, 2 (from whom further particulars may be obtained), not later than 1st August, 1958.

THE UNIVERSITY OF SHEFFIELD. Applications are invited for a post of TEMPORARY LECTURER IN CHILD HEALTH with clinical responsibilities in a Children's Hospital, to begin duties on 18th August, 1958, or as soon thereafter as possible. The appointment will be for 1 year. Salary in the range £1200–£1500 according to qualifications and experience and child allowance.

Further particulars may be obtained from the Registrar, to whom applications (3 copies) should be sent immediately and not later than 26th July, 1958.

WELSH NATIONAL SCHOOL OF MEDICINE. It is proposed to appoint an ASSISTANT MEDICAL OFFICER (Male) to the University of Wales Student Health Service in the grade Assistant Lecturer (Medical) (scale £900–£100–£1250). The appointed Medical Officer will work principally in the University College of Wales, Aberystwyth and North Wales, Bangor, and will be expected to reside in Aberystwyth. This is an appointment offering interesting work including opportunities for research.

Applications should be made within 3 weeks of the appearance of this advertisement to the Secretary, Welsh National School of Medicine, from whom further particulars can be obtained.

UNIVERSITY OF WESTERN AUSTRALIA. Applications are invited for the position of LECTURESHIP IN MICROBIOLOGY. The salary range for Lecturers at present is £A1550–£2050 p.a. for a Science graduate, and £A1650–£2150 p.a. for a Medical graduate. The commencing salary will be determined on the basis of the qualifications and experience of the appointee. An allowance is made towards travelling expenses, and housing assistance is available.

Further particulars and information as to the method of application may be obtained from the Secretary, Association of Universities of the British Commonwealth, 36, Gordon-square, London, W.C.1. The closing date for the receipt of applications, in Australia and London, is 8th September, 1958.

Hospital Services: Senior Appointments

ITALIAN HOSPITAL, Queen-square, W.C.1. (Voluntary General Hospital not nationalised.) Applications invited for the post of HONORARY ANÆSTHETIST.

Applications, stating age, qualifications, experience, accompanied by the names of 3 referees, should reach the Secretary at the Hospital (from whom further particulars may be obtained) not later than a fortnight from the appearance of this advertisement.

SOUTH EAST METROPOLITAN REGIONAL HOS-PITAL BOARD. Applications are invited for an appointment as CONSULTANT DENTAL SURGEON (whole-time or 9 notional half-days a week) for orthodontic work in the South East London area. Candidates must be Fellows in Dental Surgery, have had a wide experience in orthodontia, and should hold an appropriate diploma. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staff (England and Wales).

Applications, stating nationality, age, sex, qualifications and experience, including details of present appointment and of war or national service, together with the names and addresses of 3 referees, should be sent to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, by 9th August, 1958.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

Queen Elizabeth Hospital for Children

Part-time CONSULTANT PLASTIC SURGEON for 2 sessions a week, 1 at Banstead Wood, Surrey, and 1 at Hackney-road, E.2.

Colchester Group of Hospitals

Part-time CONSULTANT PLASTIC SURGEON for 4 sessions a week. Attendance at Essex County Hospital, Colchester, and Black Notley Hospital, Braintree.

Stepney Group of Hospitals

Maximum Part-time CONSULTANT OBSTETRICIAN AND GYNÆCOLOGIST. Duties at Mile End Hospital, E.1 (7 sessions), and East End Maternity Hospital, E.1 (2 sessions). Residence within reasonable distance of Stepney is required.

Goodmayes Hospital, Essex

Part-time CONSULTANT in Electroencephalography for 2 sessions a week. The Electroencephalography Department serves hospitals and clinics in N.E. London and adjoining areas.

Warley Hospital, Brentwood, Essex

Full-time CONSULTANT PSYCHIATRIST.

Duties will include outpatient clinics. Modern house available.

Applications (6 copies), stating post(s) concerned, and names of 3 referees, should reach the Secretary 11A, Portland-place, London, W.1, by Saturday, 16th August, 1958.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

1. CONSULTANT PHYSICIAN, 2 or 3 half-days a week, Mount Vernon Hospital, Northwood, Middlesex (551 Beds).

Applications before 25th August, 1958.

2. CONSULTANT PSYCHIATRIST AND MEDICAL DIRECTOR, 9 half-days a week, Child Guidance Training Centre, 6, Osnaburgh-street, N.W.1.

Applications before 27th August, 1958.

Hospital and Centre may be visited by direct appointment.

Application forms obtainable from and returnable to Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1.

ST. THOMAS'S HOSPITAL, London, S.E.1. Assistant to the Department of Venereal Diseases required from 11th November, 1958, to carry out 8 half-day sessions per week. Salary £1315 9s. 8d.–£1691 6s. 8d. p.a.

Applications (12 copies), naming 3 referees, to Clerk of the Governors by 23rd August, 1958.

LEEDS REGIONAL HOSPITAL BOARD. Consultant PSYCHIATRIST AND PHYSICIAN-SUPERINTENDENT at Broadgate Hospital (650 Beds), Beverley, East Riding. The successful candidate will have extramural duties at general hospitals in the Hull and East Riding areas. The appointment may be either resident or non-resident. Candidates for the above appointment should hold high qualifications in medicine and psychiatry and have had experience of administrative aspects of the specialty.

Applications (12 copies), stating age, qualifications and details of appointments held showing dates, with names and addresses of 3 referees, to the Secretary, Park-parade, Harrogate, not later than 26th August, 1958.

LEEDS REGIONAL HOSPITAL BOARD. Senior Casualty OFFICER (whole-time) for duties at the Royal Halifax Infirmary. The appointment will include duties in casualty and orthopædic surgery at the above Hospital with associated ward and operating duties under the general supervision of the Consultant in charge. The person appointed will be required to reside in Halifax. The salary will be within the range of £1653 15s.–£2126 5s. p.a. and the tenure of the post will be for a period not exceeding 4 years.

Applications (12 copies), stating age, qualifications, details of appointments held, showing dates, with names and addresses of 3 referees, to the Secretary, Park-parade, Harrogate, by 7th August, 1958.

LEEDS REGIONAL HOSPITAL BOARD. Locum vacancies.

Obstetrics and Gynæcology

Locum CONSULTANT in Obstetrics and Gynæcology (maximum part-time)—Huddersfield Halifax area—duties mainly obstetric. The post will be vacant on 1st August and the appointment will be for approximately 3–4 months. Applications will be considered from candidates who are able to undertake a limited number of sessions only.

Orthopædics

Whole-time Locum SENIOR REGISTRAR in Orthopædics for duties at hospitals in the York A and Tadcaster Group. The post is now vacant and the appointment will be for approximately 3 months.

Applications, stating age, qualifications, details of appointments held, showing dates (and number of sessions available—obstetrical and gynæcological post only) with the names and addresses of 3 referees, to the Secretary, Park-parade, Harrogate, by 28th July, 1958.

LIVERPOOL REGIONAL HOSPITAL BOARD. FAZAKERLEY HOSPITAL. Applications are invited for the post of Whole-time CONSULTANT PHYSICIAN (resident) and DEPUTY MEDICAL SUPERINTENDENT (resident) at the above Hospital. Applicants must have a higher qualification in medicine and considerable experience in infectious diseases, especially among children.

Forms of application from Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be returned not later than 9th August, 1958.

VINCENT COLLINGE, Secretary to the Board.

MEDWAY AND GRAVESEND HOSPITAL MANAGEMENT COMMITTEE. Locum Tenens CONSULTANT in Physical Medicine required until permanent appointment made. 2 to 6 sessions weekly. Salary according to grading.

Applications to Group Secretary, 20, Star Hill, Rochester, Kent, stating age, qualifications, experience and names of 2 referees.

MANCHESTER REGIONAL HOSPITAL BOARD.

(*a*) Maximum Part-time CONSULTANT PHYSICIAN to the Burnley and District Group of hospitals (Burnley General, Victoria and Reedyford Memorial Hospitals). Higher qualifications essential, appointee to live in or near to Burnley. 5th August, 1958.

(*b*) Maximum Part-time CONSULTANT PSYCHIATRIST to the Psychiatric Department at Ashton-under-Lyne General Hospital, with duties also at Parkside (Mental) Hospital, Macclesfield (1700 Beds). Wide experience and higher qualifications essential; appointee to live in or near Ashton. 30th July, 1958.

(*c*) Maximum Part-time CONSULTANT ANÆSTHETIST to the Macclesfield and District Group of hospitals, mainly at Macclesfield General Hospital. Appointee will be required to coordinate and organise the anæsthetic services in the Group and to live in or near Macclesfield. Wide experience and higher qualifications essential. 7th August, 1958.

(*d*) Part-time (7 half-days) CONSULTANT CHEST PHYSICIAN to the Blackpool and Fylde Group of hospitals, with main duties at the Blackpool Chest Clinic, Devonshire Road and Elswick Hospitals. Wide experience in diseases of the chest and membership of a Royal College of Physicians essential; appointee to live in or near to Blackpool. 6th August, 1958.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by the dates stated.

NORTH GLOUCESTERSHIRE CLINICAL AREA. South WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of ASSISTANT GERIATRICIAN in the North Gloucestershire Clinical Area. The appointment will be on a whole-time basis in the Senior Hospital Medical Officer grade. The successful candidate, who will have charge of beds at Delancey Hospital and St. Paul's Hospital, Cheltenham, will work under the general direction of the Consultant Geriatrician, and will be required to visit other hospitals in the clinical area as determined by the Regional Board.

Applications (12 copies), stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 9th August, 1958.

OXFORD REGIONAL HOSPITAL BOARD invite applications for the post of ASSISTANT SENIOR MEDICAL OFFICER. The candidate appointed will be required to assist the Senior Administrative Medical Officer in the planning, organisation and staffing of the hospital and specialist services of the region, and to carry out such administrative and executive duties as may be assigned to him. Previous experience in medical administration essential and knowledge of mental health services desirable. Salary £1764–£84(4)–£1051(1)–£2205 p.a., subject to National Health Service (superannuation) regulations.

Applications, giving full details, together with the names and addresses of 3 referees, should reach the Secretary, 43, Banbury-road, Oxford, by 15th August, 1958. Further particulars on application.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of CONSULTANT RADIOLOGIST at Dumfries and Galloway Royal Infirmary, Dumfries. The appointment will be whole-time or on the maximum part-time basis of 9 notional half-days per week.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, not later than 30 days after the publication of this advertisement.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time CONSULTANT PSYCHIATRIST required to be designated Medical Superintendent of Balderton Hospital, near Newark, a new hospital with 252 Beds at present for all grades of mental defectives.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 9th August, 1958.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires a CONSULTANT DERMATOLOGIST (maximum part-time or full-time) for duties in the Winchester, Alton, Salisbury and Portsmouth Groups. There is a Consultant Dermatologist in the Portsmouth Group, but the successful candidate will be in sole charge of the Dermatological Departments in Winchester, Alton and Salisbury. Residence within Salisbury or Winchester is a condition of the appointment. Canvassing will disqualify but candidates may visit the hospitals by arrangement with the Group Secretary, Royal Hants County Hospital, Romsey-road, Winchester; Group Secretary, Lord Mayor Treloar Hospital, Alton; Group Secretary, Odstock Hospital, Salisbury; and Group Secretary, St. Mary's Hospital, Milton-road, Portsmouth.

Applications (7 copies), stating age, qualifications, experience and names and addresses of 3 referees, to the Area Secretary, Highcroft, Romsey-road, Winchester, by 16th August, 1958.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires a DIAGNOSTIC CONSULTANT RADIOLOGIST (8 half-days per week) to work in the Southampton Group and Bournemouth and East Dorset Group of hospitals. The successful candidate will be required to undertake approximately 3–4 half-days per week at Lymington Hospital in the Southampton Group and the remainder of his time in the Bournemouth and East Dorset Group of hospitals. Wide experience and higher qualifications are essential. Residence in Lymington/Christchurch area is a condition of the appointment. Canvassing will disqualify but candidates may visit the hospitals by arrangement with the Group Secretary, Bullar-street, Southampton, and the Group Secretary, Royal Victoria Hospital, Gloucester-road, Boscombe, Bournemouth.

Applications (7 copies), stating age, qualifications, experience, and names and addresses of 3 referees to the Area Secretary, Highcroft, Romsey-road, Winchester, by 16th August, 1958.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires a Part-time CONSULTANT ORTHOPÆDIC SURGEON (9 half-days per week) for the Orthopædic and Traumatic Surgery Services of the Portsmouth Group. The main duties will be at the Royal Portsmouth Hospital which is the major accident centre of the Group. Residence in or within a radius of approximately 10 miles of Portsmouth is a condition of the appointment. Canvassing will disqualify but candidates may visit the hospitals by arrangement with the Group Secretary, St. Mary's Hospital, Milton, Portsmouth.

Applications (7 copies), stating age, qualifications, experience, and names and addresses of 3 referees, to the Area Secretary, Highcroft, Romsey-road, Winchester, by 16th August, 1958.

WELSH REGIONAL HOSPITAL BOARD. Whole-time CONSULTANT PSYCHIATRIST, Morgannwg Hospital, Bridgend (2359 Beds). Applicants must have had wide experience in psychiatry, hold a Diploma in Psychological Medicine, be competent to take clinical responsibility and to participate in the work of the Associated Outpatient Clinics and Domiciliary Consultant Service in the area served by the Hospital. E.E.G. experience will be an additional advantage. Married accommodation available if required.

Applications (12 copies), naming 3 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 21 days.

WELSH REGIONAL HOSPITAL BOARD. Whole-time Locum Tenens CONSULTANT in General Surgery required Llanelly Hospital, 28th July to 16th September, 1958.

Applications, naming 2 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff.

NEW ZEALAND. THE OTAGO HOSPITAL BOARD, UNIVERSITY OF OTAGO. Assistant Director of Anæsthetic Services and Lecturer in Anæsthetics, Otago Medical School. Applications are invited for the position of ASSISTANT DIRECTOR of Anæsthetic Services to The Otago Hospital Board and LECTURER in Anæsthetics, University of Otago, from persons holding a degree in Medicine at an approved University and who must either:—

(*a*) Hold a higher qualification in anæsthetics and have had 5 years' or more experience in this specialty; or

(*b*) Have been qualified for a period of 15 years or more and have had 8 years' or more practical experience in anæsthetics.

The salary payable is that under the Hospital Employment (Medical Officers) Regulations, viz: £2040–£2340 p.a. The commencing rate of salary within the scale will be dependent on the qualifications and experience of the appointee and will be determined by the Medical Officers Salaries Grading Committee.

The position is a full-time one and private practice is not permitted. The appointment is subject to termination by 3 months' notice in writing from either side.

Travelling expenses will be paid in accordance with the information contained in the Conditions of Appointment.

Conditions of appointment and application forms may be obtained from the Office of the High Commissioner for New Zealand, 415, The Strand, London, or from the undersigned.

Applications, stating age, qualifications and experience, together with health and chest certificates, and testimonials, will be received by the undersigned until 10 o'clock A.M. on Monday, 29th September, 1958.

W. A. WILLIAMSON, Secretary, Otago Hospital Board.
P.O. Box 946, Dunedin, N.Z.

TASMANIA. LAUNCESTON GENERAL HOSPITAL. Applications from qualified medical practitioners are invited for the position of CLINICAL PATHOLOGIST. Preference will be given to applicants with experience in the general field of pathology and in possession of a higher qualification. Salary £2500 (Aust.) p.a., rising by yearly increments to a maximum of £3000 p.a.

Details of this appointment and conditions of service may be obtained on application in writing to the General Superintendent. Closing date for applications—15th August, 1958.

B. W. GRIFFITHS, Secretary.

Hospital Services: Junior Appointments

BETHNAL GREEN HOSPITAL, Cambridge Heath-road, London, E.2. HOUSE SURGEON, pre-registration post vacant 21st July.

Applications, stating experience, and copies of 2 testimonials, to Hospital Secretary.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR required. Post recognised for F.F.A. R.C.S. Hospital may be visited by direct appointment.

Application forms from, and returnable to, Group Secretary, Central Middlesex Group Hospital Management Committee, Park Royal, N.W.10, by 29th July, 1958.

CHARING CROSS HOSPITAL GROUP. Locum Full-time NON-RESIDENT PÆDIATRIC SENIOR REGISTRAR. Tenable from 8th September, 1958, for 1 year. Candidates should have had experience in pædiatrics, and preference will be given to those holding the M.R.C.P. The Registrar's duties will include work in the Pædiatric Departments of Charing Cross, Harrow, Kingsbury, Wembley and Mount Vernon Hospitals.

Application forms, obtainable from the undersigned, should be returned by 31st July, 1958.

FRANK HART, Secretary to the Board.
Charing Cross Hospital, W.C.2.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. Applications are invited from pre-registration and registered Women medical practitioners for the post of FIRST HOUSE SURGEON with charge of general surgical beds. 6-month appointment, to start as soon as possible. Salary according to Ministry of Health scale for House Officers.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary, Elizabeth Garrett Anderson Hospital, by 23rd July.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from pre-registration and registered Women medical practitioners for the post of OBSTETRIC HOUSE SURGEON (recognised for the M.R.C.O.G.). Duties to commence 1st September, 1958. Appointment for 6 months. Salary in accordance with Ministry of Health scale for House Officers.

Applications, with copies of 3 recent testimonials, to be sent to the Secretary, Elizabeth Garrett Anderson Hospital, by 23rd July, 1958.

CHILDREN'S HOSPITAL, Sydenham, London, S.E.26. HOUSE OFFICER (medicine and surgery) required 1st September. Recognised for D.C.H.

Apply, naming 2 referees, to Administrative Officer by 25th July.

FOREST GATE HOSPITAL, Forest-lane, E.7. Pre-registration OBSTETRIC HOUSE OFFICER (second post) required for 6 months commencing 1st September, 1958. The appointment is recognised for training candidates for M.R.C.O.G. and D.Obst.R.C.O.G.

Applications, with names of 2 referees, to Hospital Secretary by 26th July, 1958.

GERMAN HOSPITAL, London, E.8. (General, 157 Beds.) Applications for the 6 months' resident appointment, vacant 21st August, of Pre-registration HOUSE SURGEON, should be sent to the Group Secretary, Hackney Hospital, E.9, by 28th July, quoting GH HS.

GREENWICH AND DEPTFORD AND SEAMEN'S GROUPS. SENIOR HOUSE OFFICER (pathology). Vacancy in Group Laboratories. Post recognised for D.Path. of Conjoint Board; suitable for candidate reading for higher degree and wishing to obtain laboratory experience.

Applications, stating age, qualifications and experience, with names of 2 referees, to Group Secretary, Seamen's Hospital, Greenwich, S.E.10.

GROUP LABORATORY, Mile End Hospital, Bancroft-road, London, E.1. RESIDENT ASSISTANT PATHOLOGIST (Senior House Officer grade). Previous experience an advantage but not essential. Laboratory recognised for Diploma of Pathology and is well equipped with excellent training facilities. Post vacant 28th July, 1958.

Applications, stating age, nationality, qualifications, experience, and copies of not more than 3 testimonials, to the Secretary, Stepney Group Hospital Management Committee, Mile End Hospital, Bancroft-road, London, E.1.

GUY'S HOSPITAL, S.E.1. Applications are invited for the post of REGISTRAR in the Radiotherapy Department; duties to commence as soon as possible. The post will be tenable until 30th September, 1959, in the first instance. Higher qualifications would be an advantage, but there would be opportunities for studying for the D.M.R.T. Parts I and II.

Forms of application are obtainable from, and should be lodged with, the Superintendent, Guy's Hospital, London Bridge, S.E.1, not later than 5th August, 1958.

GUY'S HOSPITAL, S.E.1. Applications are invited for the post of REGISTRAR in the Department of Diagnostic Radiology at Guy's Hospital, with appointment from 1st October, 1958, until 30th September, 1959, in the first instance.

Forms of application are obtainable from, and should be lodged with, the Superintendent, Guy's Hospital, London Bridge, S.E.1, not later than 5th August, 1958.

GUY'S HOSPITAL, S.E.1. Applications are invited for the post of SENIOR REGISTRAR in the Department of Psychological Medicine, with duties chiefly in the Outpatient Department, and the Child Psychiatry Clinic, commencing not later than 1st October, 1958. Applicants should possess a higher qualification and have experience in child psychiatric work.

Forms of application are obtainable from and should be lodged with the Superintendent, Guy's Hospital, London Bridge, S.E.1, not later than 1st August, 1958.

HIGHLANDS GENERAL HOSPITAL, Winchmore Hill, N.21. HOUSE SURGEON required. Duties mainly orthopædic with some E.N.T. and emergency general surgery. New operating-theatre, outpatient and casualty department. Post recognised for pre-registration service.

Applications, with copies of 3 testimonials and name and address of 1 referee, to Hospital Secretary.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 60, Grove End-road, London, N.W.8. Applications are invited from pre-registration or registered medical practitioners (Male) for the appointment of HOUSE SURGEON to the Midwifery and Gynæcological Departments, to begin at once. Appointment will be for a period of 6 months. National Health Service salary.

Applications to the Secretary together with copies of 3 recent testimonials.

KING'S COLLEGE HOSPITAL, Denmark Hill, S.E.5. Applications are invited for the post of SENIOR HOUSE OFFICER (non-resident) in Orthopædic Surgery. The appointment will be from 1st October, 1958, for 1 year.

Applications, stating age, education, qualifications and experience, with the names of 2 referees, should be sent to the undersigned by 2nd August, 1958.

S. W. BARNES, House Governor.

KING'S COLLEGE HOSPITAL, Denmark Hill, S.E.5. Applications are invited for the appointment of SENIOR RESIDENT MEDICAL OFFICER at the Belgrave Hospital for Children, from 1st October, 1958. The appointment is for 1 year in the first instance and will be in the grade of Registrar.

Applications, stating age, education, qualifications and experience, together with the names of 2 referees, should be sent to the undersigned by 2nd August, 1958.

S. W. BARNES, House Governor.

LAMBETH HOSPITAL, Kennington, S.E.11. Applications are invited from pre-registration and registered medical practitioners for the post of RESIDENT HOUSE SURGEON. Recognised for the F.R.C.S. Vacant 24th August, 1958. The successful candidate will be required to carry out a fortnight's locum duty commencing 10th August.

Application forms from the Hospital Secretary.

LEWISHAM GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER to the E.N.T. Surgical Unit of the above Group of hospitals. The appointment, which will be vacant on 11th August, is recognised for the D.L.O. and for 6 months' training for F.R.C.S. It includes the care of a special inpatient unit of 50 Beds dealing with all types of surgery in the specialty at Hither Green Hospital.

Applications, stating age, qualifications and experience, with copy testimonials or names of referees, to the Group Secretary, at Lewisham Hospital, London, S.E.13.

LONDON JEWISH HOSPITAL, Stepney Green, E.1. (130 Beds.) SENIOR HOUSE OFFICER (Surgical Department) required (resident). Vacancy on 1st August, 1958. Post recognised for F.R.C.S.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Hospital Secretary.

MILDMAY MISSION HOSPITAL, Austin-street, London, E.2. Applications are invited for the pre-registration post of RESIDENT HOUSE SURGEON (post recognised for F.R.C.S.) vacant on 31st July, 1958. Candidates should be in sympathy with the evangelical Christian aims of the Hospital.

Applications and references to be addressed to the Medical Superintendent as soon as possible.

MILDMAY MISSION HOSPITAL, Austin-street, London, E.2. Applications are invited for the pre-registration post of RESIDENT HOUSE PHYSICIAN/CASUALTY OFFICER, vacant on 31st July, 1958. Candidates should be in sympathy with the evangelical Christian aims of the Hospital.

Applications and references to be addressed to the Medical Superintendent as soon as possible.

MILE END HOSPITAL, Bancroft-road, London, E.1. (479 Beds.) HOUSE SURGEON (obstetrics and gynæcology) (post-registration). Recognised for D.Obst.R.C.O.G. Post vacant 4th August, 1958.

Application forms, obtainable from Physician-Superintendent, to be returned by 25th July, 1958, with copies of not more than 3 testimonials.

NELSON HOSPITAL, Kingston-road, Merton, S.W.20. HOUSE SURGEON (resident, not pre-registration). Post vacant now. Recognised for F.R.C.S.

Applications, stating age, qualifications, &c., with the names and addresses of 2 referees, should be sent to the Secretary at above address.

NORTH MIDDLESEX HOSPITAL, London, N.18. 2 RESIDENT HOUSE PHYSICIANS required, for 1st September, for 6 months. General medicine. Approved pre-registration posts (first or second).

Applications (in own handwriting), stating age, nationality, qualifications, experience, with copies of recent testimonials, to the Group Secretary, by 30th July.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. RESIDENT ANÆSTHETIC REGISTRAR required. 2 years' appointment, first year at Willesden General Hospital, Harlesden-road, N.W.10, second year at Central Middlesex Hospital, Park Royal, N.W.10.

Application forms from and returnable to Group Secretary, Central Middlesex Group Hospital Management Committee, Park Royal, N.W.10, by 29th July, 1958. Candidates are invited to visit the Hospitals by previous arrangement.

PRINCE OF WALES'S GENERAL HOSPITAL, N.15. Locum Tenens SENIOR or MID SURGICAL REGISTRAR required immediately until 16th August.

Applications to Secretary, Tottenham Group Hospital Management Committee, N.15.

QUEEN MARY'S HOSPITAL, Roehampton, London, S.W.15. ORTHOPÆDIC REGISTRAR required whole-time. National Health Service terms and conditions.

Detailed applications (4 copies), giving nationality, date of birth, qualifications, experience, present appointments and names of 3 referees, should reach the Secretary, Ministry of Health, Division 4(v), Norcross, Blackpool, Lancs, by 8th August, 1958.

ROYAL FREE HOSPITAL, W.C.1. Applications are invited for the post of MEDICAL REGISTRAR (non-resident) at the Lawn-road Branch of the Royal Free Hospital. Duties to commence on 1st October, 1958. Appointment for 1 year in the first instance. Candidates should be registered medical practitioners and members of the Royal College of Physicians.

Application forms may be obtained from the Secretary to the Board of Governors, to whom they should be returned not later than 1st August, 1958.

ROYAL FREE HOSPITAL. Applications are invited from registered medical practitioners for the post of REGISTRAR (non-resident) to the E.N.T. Department of the Royal Free Hospital. Duties to commence on 1st October, 1958.

Application forms may be obtained from the Secretary to the Board of Governors, The Royal Free Hospital, Gray's Inn-road, W.C.1, to whom they should be returned not later than 1st August, 1958.

ROYAL FREE HOSPITAL, Gray's Inn-road, W.C.1. Applications are invited for the post of NON-RESIDENT MEDICAL REGISTRAR. Duties to commence on 1st October, 1958. Appointment for 1 year in the first instance. Candidates should be registered medical practitioners and members of the Royal College of Physicians.

Application forms may be obtained from the Secretary to the Board of Governors to whom they should be returned not later than 8th August, 1958.

ROYAL LONDON HOMŒOPATHIC HOSPITAL, Great Ormond-street and Queen-square, W.C.1. Applications are invited from registered medical practitioners for the appointment of RESIDENT HOUSE SURGEON, now vacant. Post recognised for F.R.C.S. examinations, and is tenable for 6 months. Candidates will be required to attend for interview.

Applications, stating age and full particulars, to Secretary immediately.

ROYAL NATIONAL THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.1, and Golden-square, W.1, with which is associated the Institute of Laryngology and Otology (University of London). GENERAL PRACTITIONER CLINICAL ASSISTANTS and OUTPATIENT ASSISTANTS. These appointments give those engaged in general practice who are able to attend for 2 sessions weekly over a period of 15 months commencing in October, 1958, the opportunity of widening their clinical experience in the specialty. At the end of 3 months' training period the holders will be appointed as Outpatient Assistants with remuneration under paragraph 10(b) of the National Health Service terms and conditions of service.

Further particulars may be obtained from the House Governor.

ROYAL NATIONAL THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.1, and Golden-square, W.1. Locum ANÆSTHETIC REGISTRAR. There will be a vacancy from 15th September until 20th December, 1958, to attend from 9.30 A.M. to 1 P.M. on Mondays and Thursdays. Salary on Registrar grading.

Applications, with full details of previous experience, should be sent to the House Governor without delay.

SOUTH EAST REGIONAL THORACIC SURGERY UNIT (50 Beds), BROOK GENERAL HOSPITAL, Shooters Hill-road, S.E.18. SENIOR HOUSE OFFICER. Vacant mid-August. Recognised for F.R.C.S. 6 months' appointment and may then be renewed for a further period. The Unit treats all types of chest diseases and offers opportunity for comprehensive training in thoracic surgery.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time SENIOR REGISTRAR in Pathology to fill a vacancy in the approved trainee establishment at the Lewisham Group of hospitals as from 1st October, 1958. The Lewisham Group Laboratory is linked with other laboratories in South East London and duties will include work for other groups. Candidates should have had general experience in pathology and possession of a higher qualification would be an advantage. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staff (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 3 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 2nd August, 1958.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. Applications are invited for the post of RESIDENT MEDICAL OFFICER (Women) (Senior House Officer grade). Appointment is for 6 months, renewable. Duties include care of children's ward, medical beds, E.N.T., and administration. Offers suitable experience to those intending to enter general practice. Vacant 18th August, 1958.

Forms of application from the Secretary.

ST. JAMES' HOSPITAL, Balham, London, S.W.12. South WEST METROPOLITAN REGIONAL HOSPITAL BOARD. E.N.T. REGISTRAR (resident) required. Post vacant 1st October.

Application forms, obtainable from Group Secretary, Wandsworth Hospital Group, at above address, to be completed and returned by 2nd August.

ST. LEONARD'S HOSPITAL, Nuttall-street, London, N.1. Applications are invited from registered or provisionally registered medical practitioners for the post of HOUSE SURGEON for 6 months.

Apply immediately, with 2 recent testimonials, to Hospital Secretary.

ST. LEONARD'S HOSPITAL, Nuttall-street, N.1. (Acute General—192 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER in General Medicine. The appointment is for 12 months and is vacant on 26th August, 1958.

Applications, with 2 testimonials, to the Hospital Secretary by 25th July, 1958.

ST. MARY'S HOSPITAL, W.2. Casualty Surgeon, graded Senior House Officer (non-resident), for a first period from a date to be arranged in August, until 28th February, 1959.

Applications, giving full details, with names and addresses of 3 referees, should reach the House Governor not later than 28th July, 1958.

ST. STEPHEN'S HOSPITAL, Chelsea, S.W.10. Locum PÆDIATRIC HOUSE PHYSICIAN (with some dermatology duties) required from 22nd July, for an indefinite period.

Applications to Medical Superintendent or telephone FLAxman 8161, extension 1.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy on 6th September, 1958, for an ASSISTANT RESIDENT MEDICAL OFFICER (Senior House Officer) at the country branch hospital, Tadworth, Surrey (101 Beds).

Further particulars and form of application, which must be returned by 28th July, 1958, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

UNIVERSITY COLLEGE HOSPITAL AND MAIDA VALE HOSPITAL FOR NERVOUS DISEASES. Applications are invited for a joint SENIOR REGISTRARSHIP in the X-ray Diagnostic Departments of University College Hospital (7 half-days a week) and of the Maida Vale Hospital for Nervous Diseases (4 half-days a week) for 1 year in the first instance from 1st October, 1958.

Applications, with names of 2 referees, to T. F. W. MACKEOWN, Administrator and Secretary, University College Hospital, Gower-street, W.C.1, by 5th August, 1958.

WHIPPS CROSS HOSPITAL, London, E.11. Applications are invited for the post of HOUSE SURGEON in the Orthopædic Department (post- or pre-registration). This post, which is recognised for the F.R.C.S., becomes vacant 3rd August, 1958.

Application forms from the Hospital Secretary, to be returned within 10 days of the appearance of this advertisement.

WHIPPS CROSS HOSPITAL, London, E.11. Leytonstone (NO. 10) HOSPITAL GROUP. Applications are invited for the post of SENIOR HOUSE OFFICER (Casualty Officer) at above Hospital. This post, which is recognised by the Royal College of Surgeons for 6 months' casualty training under the Fellowship regulations, becomes vacant on 16th July, 1958.

Application forms are obtainable from the Hospital Secretary, to whom they should be returned by 29th July, 1958.

WANSTEAD HOSPITAL, Hermon Hill, E.11. (191 Beds.) Applications invited for post of SENIOR (RESIDENT) HOUSE OFFICER, vacant 26th July. Salary £819 10s. p.a. less £150 p.a. for board-residence. Post includes care of general surgical and orthopædic cases and duties in Casualty Department. Post recognised for F.R.C.S. examination.

Applications, stating age, qualifications, experience, together with copies of 2 recent testimonials, should be sent to Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

ABERDEEN GENERAL HOSPITALS BOARD OF MANAGEMENT. Applications are invited for the appointment of a REGISTRAR in Surgery with duties in the Aberdeen Royal Infirmary and other hospitals. The post is a whole-time one and is non-resident. Salary and conditions of service in accordance with the terms issued by the Department of Health for Scotland.

Applications, giving details of qualifications and experience, with the names of 2 referees, should be lodged with the Secretary, Aberdeen General Hospitals, P.O. Box 92, 62, Queen's-road, Aberdeen, by 2nd August, 1958.

ABERDEEN GENERAL HOSPITALS BOARD OF MANAGEMENT. Applications are invited for the appointment of a REGISTRAR in Ophthalmology for the Aberdeen Royal Infirmary. The post, which becomes vacant on 5th October, 1958, is a whole-time one and is non-resident. Salary and conditions of service in accordance with the terms issued by the Department of Health for Scotland.

Applications, giving details of qualifications and experience, with the names of 2 referees, should be lodged with the Secretary, Aberdeen General Hospitals, P.O. Box 92, 62, Queen's-road, Aberdeen, by 2nd August, 1958.

ABERDEEN GENERAL HOSPITALS BOARD OF MAN-AGEMENT. Applications are invited from post- or pre-registration practitioners for appointment as HOUSE SURGEON in the E.N.T. Department of the Aberdeen Royal Infirmary. The appointment, which is resident, is for the 6-month period commencing 1st August, 1958. The appointment is approved as a pre-registration post and tenure for the subscribed period will count towards full registration on the Medical Register for provisionally registered practitioners. Salary and conditions of service in accordance with the terms issued by the Department of Health for Scotland.

Applications, with full details and giving the names of 2 referees, should be lodged immediately with the Secretary, Aberdeen General Hospitals, P.O. Box 92, 62, Queen's-road, Aberdeen.

ABERDEEN. ROYAL ABERDEEN HOSPITAL FOR SICK CHILDREN. HOUSE OFFICER (pre- or post-registration) required for the period 1st August, 1958–31st January, 1959. The post offers experience mainly in eye and skin conditions and is classified for pre-registration purposes as medical.

Applications, with full details, as soon as possible, to Group Medical Superintendent, Royal Aberdeen Hospital for Sick Children, Westburn-drive, Aberdeen.

ABERYSTWYTH, CARDIGANSHIRE. GENERAL HOS-PITAL. MID-WALES HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (surgical) required (resident). Post recognised for F.R.C.S. examination. Vacancy immediate.

Applications, stating age, experience, &c., to the Group Secretary, Mid-Wales Hospital Management Committee, 31, North-parade, Aberystwyth, Cardiganshire.

ALTON GENERAL HOSPITAL, Alton, Hampshire. RESIDENT HOUSE SURGEON (Senior House Officer grade) required for general surgical duties. Post vacant September. Recognised for F.R.C.S. 136 Beds. Acute general. 6 months' appointment.

Applications and copies of testimonials to be sent to the Hospital Secretary.

AMERSHAM GENERAL HOSPITAL, Buckinghamshire. (297 Beds.) RESIDENT SENIOR HOUSE OFFICER required for Orthopædic and Casualty Department for period of 1 year. Post recognised for F.R.C.S. The department forms part of the Regional Accident and Orthopædic Service based on the Nuffield Orthopædic Centre, Oxford.

Applications, with names and addresses of 3 referees, to Hospital Secretary.

ASHFORD HOSPITAL, Ashford, Middlesex. (560 Beds.) STAINES GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT SENIOR HOUSE OFFICER in Pathology. Previous clinical experience essential but pathological experience not essential.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital, immediately.

ASHFORD HOSPITAL, Ashford, Middlesex. (560 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SURGICAL REGISTRAR required at above Hospital for Traumatic and Orthopædic Surgery. Post vacant now. Hospital may be visited by direct appointment with the Medical Director.

Application forms obtainable from and returnable to the Secretary, Ashford Hospital, Ashford, Middlesex, by 29th July, 1958.

ASHFORD HOSPITAL, Ashford, Middlesex. (560 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SURGICAL REGISTRAR required at above Hospital for General Surgery. Post vacant now. Hospital may be visited by direct appointment with the Medical Director.

Application forms obtainable from and returnable to the Secretary, Ashford Hospital, Ashford, Middlesex, by 29th July, 1958.

ASHFORD HOSPITAL, Ashford, Middlesex. (560 Beds with all the usual special departments.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR required at above Hospital for general anæsthetic duties at Ashford and such other hospitals within the Group as may be necessary. Post recognised for D.A. and F.F.A. R.C.S., vacant 7th September, 1958. Hospital may be visited by direct appointment with the Medical Director.

Application forms obtainable from and returnable to the Secretary, Staines Group Hospital Management Committee, Ashford Hospital, Ashford, Middlesex, by 29th July, 1958.

ASHFORD HOSPITAL, Ashford, Middlesex. (560 Beds.) STAINES GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT SENIOR HOUSE OFFICER for General Medical duties.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital immediately.

AYLESBURY, BUCKINGHAMSHIRE. ROYAL BUCK-INGHAMSHIRE HOSPITAL. Accident and orthopædic and children's general surgery. HOUSE OFFICER required 1st August. Recognised for F.R.C.S. Pre-registration post, but registered practitioners are invited to apply.

Apply, with 2 names for reference, to Secretary-Superintendent.

AYLESBURY. ROYAL BUCKINGHAMSHIRE HOS-PITAL. CASUALTY OFFICER (Senior House Officer) required mid-August. Post recognised for F.R.C.S. Self-contained furnished flat available at moderate rental.

Apply, with copies of 2 recent testimonials, to Secretary-Superintendent.

BARNSTAPLE. NORTH DEVON INFIRMARY. (105 Beds.) HOUSE SURGEON (pre-registration) required from mid-July.

Applications, naming 2 referees, to Group Secretary, 19, Alexandra-road, Barnstaple, N. Devon.

BARROW-IN-FURNESS. RISEDALE MATERNITY HOSPITAL. Obstetric and Gynæcology Department. Applications are invited for the resident post of SENIOR HOUSE OFFICER at the above Hospital. Post available middle September, 1958. Hospital approved for D.Obst.R.C.O.G.

Applications to the Group Secretary, Barrow and Furness Hospital Management Committee, 105, Abbey-road, Barrow-in-Furness.

BEDFORD GENERAL HOSPITAL. (431 Beds.) Locum SENIOR HOUSE OFFICER (medicine), resident, required 26th July–10th August.

Inquiries and applications with copies of 2 recent testimonials to be sent immediately to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford (telephone: Bedford 5401, extension 22).

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 Beds.) HOUSE SURGEON (House Officer or Senior House Officer grade according to experience). Vacant now. General surgical duties, some orthopædics. Offers good opportunity for general experience in busy acute general hospital. Recognised for F.R.C.S. Approved pre-registration post but fully registered practitioners may apply.

Applications to Group Secretary, Westwood Hospital, Beverley, Yorkshire.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 Beds.) HOUSE PHYSICIAN. Vacant 1st August. Pre-registration post, but fully registered practitioners may apply. Married quarters may be available.

Detailed applications to Group Secretary, Westwood Hospital, Beverley, Yorkshire.

BIRMINGHAM, 18. ALL SAINTS' HOSPITAL. Senior HOUSE OFFICER (resident) required (Male or Female). The Hospital is associated with Birmingham University for teaching of psychiatry. Training for Diploma in Psychological Medicine provided.

Applications, stating age and qualifications, to the Medical Superintendent.

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. (775 Beds.) 3 HOUSE SURGEONS. Recognised for pre-registration and F.R.C.S. Vacant 1st September, 1958. Each appointment in unit of approximately 85 adult and children's general surgical beds under control of 2 Consultant Surgeons.

Detailed applications, with copies of 3 testimonials, to Group Secretary.

BIRMINGHAM, 9. LITTLE BROMWICH GENERAL HOSPITAL. HOUSE SURGEON (Male/Female). Now vacant. Recognised as pre-registration appointment.

Apply Physician-Superintendent, with copies of 2 testimonials or names of referees.

BIRMINGHAM, 9. LITTLE BROMWICH GENERAL HOSPITAL. HOUSE PHYSICIAN (Male/Female). Now vacant. Recognised pre-registration appointment.

Apply Physician-Superintendent, with copies of 2 testimonials or names of referees.

BIRMINGHAM, 9. LITTLE BROMWICH GENERAL HOSPITAL. RESIDENT MEDICAL OFFICER in Infectious Diseases (Senior House Officer grade). Hospital serves a wide area and gives opportunities for the study of infectious diseases, and has a poliomyelitis respiratory unit. Part of the Hospital is being developed as a General Hospital, where further experience can be gained.

Apply Physician-Superintendent, with 2 testimonials.

BIRMINGHAM, 9. LITTLE BROMWICH GENERAL HOSPITAL. PÆDIATRIC HOUSE PHYSICIAN (Male/Female), vacant 1st August, 1958. Recognised for D.C.H. Includes duties on infectious diseases wards, Neonatal Department, and Clinics.

Applications to Physician-Superintendent.

BIRMINGHAM. ST. CHAD'S HOSPITAL, Hagley-road, BIRMINGHAM, 16. HOUSE SURGEON required. Recognised for pre-registration.

Detailed applications, with copies of testimonials, to Group Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM (near). MARSTON GREEN MATERNITY HOSPITAL, Berwicks-lane, MARSTON GREEN, NEAR BIRMINGHAM. HOUSE SURGEON (obstetrics) required 1st September, 1958. 121 obstetric and 10 gynæcological beds. Recognised for Diploma and Obstetric part of M.R.C.O.G. Premature Baby Unit. Hospital affiliated to Birmingham Medical School for training of students.

Detailed applications, with copies of 3 recent testimonials, to Group Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) **Birmingham (Sanatoria) Group, Yardley Green Hospital, Birmingham, 9**

REGISTRAR (chest diseases and tuberculosis). Romsley Hill Hospital (136 Beds, including Diabetic Unit), Romsley, Halesowen, Birmingham. Duties also at Birmingham Chest Clinic. Accommodation for single person available.

(2) **Shrewsbury Group, Royal Salop Infirmary, Shrewsbury**

REGISTRAR (E.N.T. surgery). Eye, Ear and Throat Hospital (68 Beds) and Copthorne Hospital, Shrewsbury (168 Beds). Resident non-resident. Considerable experience specialty desirable.

Application forms, from Group Secretaries, to be returned by 28th July, 1958.

BIRMINGHAM (SANATORIA) GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER at West Heath Hospital, Rednal-road, Birmingham, 31 (207 Beds for the treatment of tuberculous and non-tuberculous chest cases). The successful applicant will reside at the above Hospital (accommodation for single person only), and will be offered facilities for undertaking duties at the Birmingham Chest Clinic, Great Charles-street, Birmingham, 3.

Applications, stating age, qualifications, training and experience, together with copies of 3 recent testimonials, should be addressed to the Group Secretary, Birmingham (Sanatoria) Group Hospital Management Committee, Yardley Green Hospital, Birmingham, 9.

BIRMINGHAM, 29. SELLY OAK HOSPITAL. (Equipped beds—1033.) HOUSE SURGEONS (pre-registration), 2 now vacant, 1 vacant 1st August. Recognised for F.R.C.S.

Apply immediately to the Medical Superintendent, giving qualifications, age, experience and enclosing copies of 3 testimonials.

BIRMINGHAM. SOLIHULL HOSPITAL, Lode-lane, SOLIHULL. HOUSE PHYSICIAN (pre-registration). Now vacant. General hospital offering good experience. 5 other resident medical staff.

Applications, with names of 2 referees, to Medical Superintendent immediately.

BIRMINGHAM. SOLIHULL HOSPITAL, Lode-lane, SOLIHULL. HOUSE SURGEON (pre-registration). General hospital offering good experience. 5 other resident medical staff.

Applications, with names of 2 referees, to Medical Superintendent immediately.

BIRMINGHAM. SOLIHULL HOSPITAL, Lode-lane, SOLIHULL. OBSTETRIC HOUSE SURGEON (pre-registration). Now vacant.

Applications, stating age, qualifications and names of referees, to Medical Superintendent immediately.

BIRMINGHAM (near). THE MIDLAND CENTRE FOR NEUROSURGERY, Holly-lane, SMETHWICK, near BIRMINGHAM. RESIDENT SENIOR HOUSE OFFICER, vacant in August (recognised for period of 6 months' unspecified training under R.C.S. regulations). This is a new hospital entirely devoted to neurology and neurosurgery, within easy reach of Birmingham. Salary on national scale less deduction for board, lodging, &c.

Applications, with names of 2 referees, to the Group Secretary, West Bromwich and District Hospitals Management Committee.

BISHOP'S STORTFORD, HERTFORDSHIRE. HERTS AND ESSEX GENERAL HOSPITAL. Applications invited for post of HOUSE OFFICER (surgical—pre-registration). Salary £467 10s. –£522 10s. p.a. less £125 for residential emoluments. Appointment to commence immediately.

Applications, stating age, nationality, qualifications and experience, with copies of 2 testimonials or names of referees, to Hospital Secretary.

BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics) required 5th August, 1958, for duties throughout the Group, mainly at Royal Infirmary, Blackburn. Residence at Royal Infirmary, Blackburn. Post recognised for D.A. and F.F.A. R.C.S.

Applications to Group Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn, giving names of 2 referees.

BLACKPOOL VICTORIA HOSPITAL. (354 Beds). HOUSE SURGEON. Resident pre-registration post available from 23rd August, 1958, in the Department of Surgery at this modern well-equipped Hospital with excellent facilities for gaining experience. Recognised for F.R.C.S.

Applications, stating age, experience and the names and addresses of 2 referees, should be sent to the Hospital Secretary.

BLACKPOOL VICTORIA HOSPITAL. (354 Beds.) HOUSE OFFICER (orthopædic and traumatic surgery). Resident pre-registration post recognised for F.R.C.S. available from 1st October, 1958, in the main acute general hospital serving the Blackpool and Fylde area.

Applications, stating age, experience (if any) and giving the names and addresses of 2 referees, should be sent to the Hospital Secretary.

BLACKPOOL VICTORIA HOSPITAL. Casualty Officer (Junior Hospital Medical Officer grade). This post, now vacant, is recognised for the F.R.C.S. and offers a variety of experience in a busy department. Residence is optional.

Applications, stating age, qualifications, experience and giving the names and addresses of 2 referees, should be sent to the Hospital Secretary.

BOGNOR WAR MEMORIAL HOSPITAL. (32 Beds.) RESIDENT SENIOR HOUSE OFFICER required to work under visiting Consultant Surgeon and Physician; also casualty work. Salary £819 10s. less £150 p.a. for residence. Modern fully-equipped theatre. Good liaison with Chichester main hospitals and with local general practitioners. Also gives opportunity for postgraduate reading.

Apply, giving 3 referees' names, to Group Secretary, 174, Broyle-road, Chichester, Sussex.

BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. THE ROYAL INFIRMARY, BOLTON (238 Beds). **BOLTON DISTRICT GENERAL HOSPITAL** (607 Beds). RESIDENT SENIOR HOUSE OFFICERS in Medicine (2), 1 for each of the above Hospitals. Vacant 22nd August (General Hospital) and 31st August (Royal Infirmary) and tenable for 12 months.

Applications, stating age, nationality, qualifications, experience and the names of 2 referees, to Group Secretary, The Royal Infirmary, Bolton.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. (494 Beds). **BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE.** Applications are invited for the appointment of 2 HOUSE PHYSICIANS. The appointments, which become vacant in mid-August, are recognised for pre-registration purposes.

Applications to the Hospital Secretary.

BRADFORD. ST. LUKE'S HOSPITAL. Locum Senior HOUSE OFFICER (general medicine and pathology). From 14th July to 24th August, inclusive.

Applications, stating age, nationality, qualifications and experience with copy testimonials, to Secretary, Royal Infirmary, Bradford.

BRIDGEND. MORGANNWG HOSPITAL. Applications are invited for the appointment of:—

1 JUNIOR HOSPITAL MEDICAL OFFICER.
2 SENIOR HOUSE OFFICERS.

These posts, which should be regarded as suitable for training purposes, offer wide experience in inpatient and outpatient psychiatry. In addition to extensive extramural work, Morgannwg Hospital has an admission-rate of well over 1000 patients per year. The several Departments include those of Pathology, X ray, Psychology, Electroencephalography, &c. All possible encouragement will be provided for study for the D.P.M., for which this Hospital is recognised. Accommodation for either single or married persons is available. Appointments are subject to terms and conditions of service for hospital medical staffs. In the case of the Junior Hospital Medical Officer the appointment will, in the first instance, be limited to 3 years.

Applicants are required to give details of experience, and the names of 3 referees, to the Group Secretary, Morgannwg Hospital, Bridgend, within 2 weeks of the appearance of this advertisement.

BRIGHTON AND LEWES HOSPITAL MANAGEMENT COMMITTEE GROUP HOSPITALS. (78 Beds.) SENIOR HOUSE OFFICER for duties in the E.N.T. Department of the above Group. Vacant beginning of August. Recognised for F.R.C.S. and D.L.O.

Applications, with details of experience, &c., together with names of 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRIGHTON GENERAL HOSPITAL. Applications are invited for the appointment of HOUSE SURGEON to the Orthopædic Unit. Salary in accordance with national scales. This is a pre-registration appointment.

Applications, stating age, qualifications, and experience, and giving the names of 2 referees, should be sent to the Physician-Superintendent, Brighton General Hospital, Elm-grove, Brighton.

BRIGHTON GENERAL HOSPITAL. Applications are invited for the appointment of SENIOR HOUSE OFFICER (orthopædics). Recognised for F.R.C.S. examinations. Salary in accordance with national scale. Vacant 9th August, 1958.

Applications, stating age, qualifications, and experience, together with copies of recent testimonials, and giving the names of 2 referees, should be sent to the Physician-Superintendent, Brighton General Hospital, Elm-grove, Brighton, 7, as soon as possible.

BRIGHTON. ROYAL ALEXANDRA HOSPITAL FOR SICK CHILDREN, Dyke-road. (120 Beds and Cots.) **BRIGHTON AND LEWES HOSPITAL MANAGEMENT COMMITTEE.** Vacancy for SENIOR HOUSE OFFICER from 25th August, 1958. Salary at the rate of £819 10s. p.a., less £150 p.a. for residential emoluments. Candidates should have had experience in pædiatrics. The post is recognised for D.C.H.

Applications, stating age, nationality, experience, together with copies of 2 testimonials and the names of 2 referees, should reach the Administrative Officer not later than 24th July, 1958.

BRIGHTON. SUSSEX EYE HOSPITAL. (56 Beds.) SENIOR HOUSE SURGEON (Senior House Officer grade) and HOUSE SURGEON required end of August. Both posts recognised for F.R.C.S. and D.O. Successful applicant for the post of House Surgeon will be considered for the senior post on completion of 6 months.

Applications, stating usual particulars, and naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (314 Beds.)

CASUALTY HOUSE SURGEON (duties include work in orthopædic and traumatic unit), end August. Recognised for pre-registration and F.R.C.S.

2 HOUSE PHYSICIANS beginning and mid-September. Pre-registration.

RESIDENT PATHOLOGIST (Senior House Officer grade) for Area Laboratory. Good experience in all branches of clinical pathology. Mid-August. Post recognised for D. Path.

Applications, stating age, qualifications, experience, and naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (314 Beds.) Locum SENIOR CASUALTY OFFICER (Junior Hospital Medical Officer) for 2 weeks commencing 24th July, 1958.

Applications, stating usual particulars, and naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRISTOL. COSSHAM AND FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. Vacancy at Frenchay Hospital (509 acute beds) for HOUSE OFFICER in General Surgery. Tenable for 6 months from 1st August, 1958. Recognised pre-registration post. Unmarried accommodation.

Applications, stating age and qualifications, and naming 2 referees, to the Group Secretary, Frenchay Hospital, Bristol.

BURNLEY GENERAL HOSPITAL. (641 Beds.) Resident HOUSE OFFICER (medical). The appointment is approved as a pre-registration post. Vacant 5th August, 1958.

Applications, with 2 references, to Group Secretary, Burnley and District Hospital Management Committee, Burnley General Hospital.

BURTON-ON-TRENT. THE GENERAL HOSPITAL. HOUSE OFFICER (orthopædics) (pre-registration post) required at the above Hospital. Recognised for F.R.C.S.

Applications to Group Secretary as soon as possible.

BURY AND ROCHDALE HOSPITAL GROUPS. Resi-DENT REGISTRAR in Psychiatry. Post now vacant.

Apply Group Secretary, Central Offices, Birch Hill Hospital, Rochdale.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. BURY GENERAL HOSPITAL. Applications invited for the post of SENIOR HOUSE OFFICER in Casualty. The post, which is recognised for the examination of the F.R.C.S., will be vacant mid-July.

Apply, stating full details of experience, &c., and names of 2 referees, to H. WILKINSON, Group Secretary, Bury General Hospital.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the undermentioned pre-registration HOUSE OFFICER posts, which are vacant at hospitals in the above Group :—

Medicine. 2 now vacant.

Surgery. 1 vacant August. 1 vacant September.

Apply, stating full details, to H. WILKINSON, Group Secretary, Bury General Hospital.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (medicine) at Rossendale General Hospital.

Apply, stating full details and names of 2 referees, to H. WILKINSON, Group Secretary, Bury General Hospital, Bury, Lancs.

CANTERBURY. KENT AND CANTERBURY HOS-PITAL. (277 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (pathology), which becomes vacant mid-July, 1958, for 1 year. Salary £819 10s. p.a., with National Health Service conditions. Experience in pathology not essential but candidates must have had previous clinical experience.

Applications, stating age, qualifications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CARLUKE, LANARKSHIRE. LAW HOSPITAL. (790 Beds.) Applications are invited for the undernoted posts :—

(1) (*a*) RESIDENT HOUSE SURGEON and (*b*) HOUSE PHYSICIAN (pre- or post-registration) for the 6 months commencing 1st August, 1958.

(2) JUNIOR HOSPITAL MEDICAL OFFICER (medical).

Applications, stating age, qualifications and previous experience, together with the names of 2 referees, to be submitted to the Group Medical Superintendent, Law Hospital, as soon as possible.

CARSHALTON, SURREY. QUEEN MARY'S HOSPITAL FOR CHILDREN. (A general children's hospital of 550 Beds.) RESIDENT MEDICAL REGISTRAR required. Recognised for D.C.H.

Applications, on forms obtainable from the Group Secretary, should be returned by 2nd August, 1958.

CARSHALTON, SURREY. QUEEN MARY'S HOSPITAL FOR CHILDREN. (A general children's hospital of 550 Beds.) HOUSE SURGEON (Senior House Officer) required (general surgery, E.N.T. and orthopædics). Recognised for D.C.H.

Applications, stating age and qualifications, together with 1 recent testimonial and the names of 2 referees, should be submitted to the Group Secretary immediately.

CHESTERFIELD ROYAL HOSPITAL. House Physician (Senior House Officer grade) required 1st September at the above Hospital for 54-Bed Medical Unit. Post offers good experience in general medicine, and in paediatrics, diabetics, and dermatology. National salary and conditions.

Further particulars obtainable on request from the Group Secretary, Chesterfield Hospital Management Committee, to whom applications should be submitted immediately.

CHESTERFIELD. SCARSDALE HOSPITAL. Applica-tions are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER required 1st September for Geriatric Unit and for duties at Penmore Hospital. Full Consultant services. Excellent scope for doctor interested in this specialty. House available on service tenancy.

Applications, giving full particulars, with the names of 3 referees, to Group Secretary, Chesterfield Hospital Management Committee, at Chesterfield Royal Hospital.

CHICHESTER. ROYAL WEST SUSSEX HOSPITAL. (202 acute beds.) RESIDENT HOUSE SURGEON required for 6 months' appointment. National salary scales for either provisionally or fully registered practitioners. Post approved for pre-registration practitioners and F.R.C.S. 8 residents. Vacant 18th August, 1958.

Applications, stating age, experience, qualifications with reference or names of referees, to Senior Administrative Officer.

CHICHESTER. ST. RICHARD'S AND ROYAL WEST SUSSEX HOSPITALS. Applications are invited for the post of RESIDENT OBSTETRIC AND GYNÆCOLOGY SENIOR HOUSE SURGEON, for 6 months in first instance. Obstetrics at St. Richard's (where resident) and gynæcology at both Hospitals. Occasional relief duties at Maternity Hospital, Rustington (50 Beds). Salary £819 10s., less £150 p.a. for residence.

Apply Group Secretary, 184, Broyle-road, Chichester, giving names of 2 referees.

CHICHESTER. ST. RICHARD'S HOSPITAL. Applica-tions are invited for the post of HOUSE PHYSICIAN (recognised for pre-registration) for 6 months only in the first instance. Vacant middle of August, 1958.

Applications, stating age, qualifications and experience, and giving names of 2 persons to whom reference may be made, should be sent to the Surgeon-Superintendent.

CHICHESTER, SUSSEX. GRAYLINGWELL HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of SENIOR REGISTRAR (whole-time) at the above Hospital. Applicants should have had a wide psychiatric experience, and possession of the D.P.M. or its equivalent is essential. Graylingwell is a modern hospital with all forms of inpatient and outpatient treatment and has 3 active outpatient clinics. There are Departments of Research, Neurology, Psychology and Social Service, and there is a modern electro-encephalographic unit. A house on the hospital estate may be available.

Application forms, for which a stamped addressed envelope should be supplied, may be obtained from the Group Secretary, Graylingwell Hospital, Chichester, and 6 copies should be returned to him, duly completed, not later than 14 days after the appearance of this advertisement.

CHELTENHAM GENERAL HOSPITAL. (220 Beds.) HOUSE SURGEON required (pre- or post-registration). The post offers a wide experience in general surgery, gynæcology, and orthopædic surgery. Post recognised for the F.R.C.S.

Apply, with names of 2 referees, to the Secretary, General Hospital, Cheltenham.

COLCHESTER, ESSEX. ROYAL EASTERN COUNTIES HOSPITAL. Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER (Male or Female, resident or non-resident). This Hospital admits mental defectives of both sexes and of all ages and grades. National Health Service salary scale. Excellent facilities exist for study.

Applications, giving full details and with names of 2 referees, to the Group Secretary at Abbeygate House, Colchester.

COLCHESTER, ESSEX. SEVERALLS HOSPITAL. SENIOR HOUSE OFFICER required at the above Mental Hospital. There are excellent opportunities for up-to-date experience and postgraduate work in all branches of psychiatry, including treatment of neurosis. Opportunities will be given at the Hospital for clinical instruction for the D.P.M.

Applications, with particulars and copies of testimonials, or names of referees, to the Medical Superintendent as soon as possible.

COLCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications invited for:—

Black Notley Hospital, Braintree, Essex (522 Beds.)

Post of HOUSE PHYSICIAN. Pre-registration or third post. Includes duties in medical and paediatric wards. Tenable for 6 months.

Post of Locum SURGICAL REGISTRAR, for period 11th–24th August, 1958.

Post of Locum REGISTRAR for Pulmonary Tuberculosis Unit, including non-tuberculous diseases of the chest; also duties at chest clinics. Required 1st September for few months.

Essex County Hospital, Colchester, Essex (181 Beds.)

Post of Locum SURGICAL REGISTRAR. Required from 31st July, 1958.

Clacton and District Hospital, Clacton-on-Sea, Essex (58 Beds.)

Post of SENIOR HOUSE OFFICER. Duties include medical, surgical, and casualty work. Post tenable for 6 months or 1 year.

Applications, with copies of 3 testimonials, to Group Secretary, 14, Pope's-lane, Colchester, Essex.

CREWE AND DISTRICT MEMORIAL HOSPITAL. (108 Beds—acute, and continuation 32 Beds.) SENIOR HOUSE OFFICER (casualty) required. Approved for F.R.C.S. Now vacant. Modern well-equipped department. Whitley Council salary scale and conditions of service.

Apply immediately, stating age, qualifications, &c., with names of 2 referees, to reach the Group Secretary, South Cheshire Hospital Management Committee, Barony Hospital, Nantwich, Cheshire, not later than 19th July, 1958.

CREWE MEMORIAL HOSPITAL. Orthopædic Registrar required. New fully equipped department. The post, which is recognised for F.R.C.S., offers good facilities for study, and will be vacant from mid-August.

Apply, giving names of 3 referees, to the Group Secretary, South Cheshire Hospital Management Committee, Barony Hospital, Nantwich, Cheshire, within 7 days.

CUCKFIELD HOSPITAL, Cuckfield, near Haywards HEATH. MID-SUSSEX HOSPITAL MANAGEMENT COMMITTEE. Posts vacant end July :—

JUNIOR HOUSE SURGEON (Orthopædic and Traumatic Unit).

JUNIOR HOUSE PHYSICIAN. Post approved for pre-registration but fully registered practitioners may apply.

JUNIOR HOUSE SURGEON (general surgery). Pre-registration post.

Apply Hospital Secretary, stating age, nationality, qualifications and experience, with names of 2 referees.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (416 Beds.) HOUSE PHYSICIAN (pre-registration) or SENIOR HOUSE OFFICER (general medicine), vacant late August.

Apply, stating full details with copies of 2 testimonials, to Secretary.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (416 Beds.) SENIOR HOUSE OFFICER in Clinical Pathology. Vacant 26th August. Preference will be given to an applicant who is studying for a higher qualification in any branch of medicine, not necessarily pathology. The holder is expected to attend clinical work in the Royal Infirmary and sometimes in associated hospitals.

Apply, stating full details and 2 names for reference, to Secretary.

DERBY. DERBYSHIRE ROYAL INFIRMARY (416 Beds), DERBY CITY HOSPITAL (260 Beds). (Post recognised for training for D.A. and F.F.A. R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (anæsthetics) required for the above Hospitals. Duties also at other hospitals in the Group. This post offers special experience in neuro and orthopædic surgery and obstetrics. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 28th July, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

DERBY. DERBYSHIRE CHILDREN'S HOSPITAL. (86 Beds.) Paediatrics. Applications are invited for the post of SENIOR HOUSE OFFICER (paediatrics) vacant 1st September, 1958, tenable for 6 months. Duties mainly medical but include some surgery. Post recognised for D.C.H.

Applications, with names of 2 referees, to be sent as soon as possible to Secretary.

DERBY. DERBYSHIRE CHILDREN'S HOSPITAL. (86 Beds.) Applications invited for post of HOUSE OFFICER or SENIOR HOUSE OFFICER (paediatrics), vacant 16th July, 1958, tenable for 6 months. Duties mainly surgical, but include some medicine. Post recognised for D.C.H. and is open to pre-registration graduates.

Applications, with names of 2 referees, to be sent as soon as possible to Secretary.

DERBY. DERBYSHIRE HOSPITAL FOR WOMEN, FRIAR GATE. HOUSE SURGEONS (pre-registration) or SENIOR HOUSE OFFICERS (gynæcology) required on 21st August, 1958, and 1st September, 1958. Recognised for M.R.C.O.G. in gynæcology only.

Apply, stating full details, with copies of 2 recent testimonials, to Hospital Secretary, Derbyshire Hospital for Women.

DAGENHAM HOSPITAL, Rainham-road South, Dagenham, ESSEX (near Dagenham East Underground Station). There is a vacancy for a JUNIOR HOSPITAL MEDICAL OFFICER (resident) at the above Hospital (150 Beds) for pulmonary tuberculosis—all stages. Salary in accordance with the national scale (£852 10s.–£55–£1182 p.a.) less residential charges. Suitable for candidate studying for higher degree. Further particulars from the Physician-Superintendent.

Applications, stating age, qualifications and previous experience, together with recent testimonials, should be sent to the undersigned within 7 days of the appearance of this advertisement.

H. F. HARRIS, Group Secretary,
Ilford and Barking Group Hospital Management Committee.
King George Hospital, Ilford.

DEWSBURY, YORKSHIRE. THE GENERAL HOSPITAL. (128 Beds.) Applications are invited for the pre-registration post of HOUSE PHYSICIAN (general medicine and paediatrics) which falls vacant on 1st August, 1958.

Applications, giving full details, should be sent to the Administrative Officer at the Hospital.

DEWSBURY, YORKSHIRE. THE GENERAL HOSPITAL. (128 Beds.) Applications are invited for the pre-registration post of HOUSE OFFICER (general surgery) for either the full 6 months or for a Locum appointment for 4–5 months, commencing 1st September, 1958.

Applications, giving full details, should be sent to the Administrative Officer at the Hospital as soon as possible.

DONCASTER ROYAL INFIRMARY. (330 Beds.) Applications are invited for the post of HOUSE PHYSICIAN (Intern or Senior House Officer).

Applications, with particulars of experience and copies of 2 recent testimonials, to the Group Secretary, Doncaster Hospital Management Committee, at Doncaster Royal Infirmary.

DONCASTER. WESTERN HOSPITAL. (Recognised under the regulations for the D.Obst.R.C.O.G. and M.R.C.O.G. (obstetrical experience) and approved for pre-registration service under the Medical Act, 1950.) Applications are invited for the post of OBSTETRICAL HOUSE OFFICER (Senior House Officer or pre-registration post). Vacant mid-August.

Applications should be forwarded to the Group Secretary, Doncaster Hospital Management Committee, at Doncaster Royal Infirmary by 30th July.

DORCHESTER. DORSET COUNTY HOSPITAL. House SURGEON (Male or Female) required for resident, pre-registration post becoming vacant early August. Recognised for F.R.C.S. examination and tenable for 6 months.

Applications, stating age, qualifications, together with copy testimonials, to Group Secretary, West Dorset Hospital Management Committee, Damers-road, Dorchester, Dorset.

DRIFFIELD, YORKSHIRE. EAST RIDING GENERAL HOSPITAL. (247 Beds.) HOUSE SURGEON (first, second or third post). Vacant now. General surgery, casualty and some orthopædics. Approved pre-registration post. Fully registered practitioners may apply. Married quarters may be available.

Applications to Group Secretary, Westwood Hospital, Beverley, Yorkshire.

DRIFFIELD, YORKSHIRE. EAST RIDING GENERAL HOSPITAL. (247 Beds.) JUNIOR HOUSE PHYSICIAN, vacant now. Approved pre-registration post, but fully registered practitioners may apply. Duties to include geriatrics and acute medicine. Good general experience. Married quarters may be available.

Apply Group Secretary, Westwood Hospital, Beverley, Yorkshire.

DORKING GENERAL HOSPITAL. Locum Senior HOUSE OFFICER required for general duties and casualty work for about 3 months.

Apply Medical Superintendent, Dorking General Hospital, Horsham-road, Dorking, Surrey.

DUDLEY, STOURBRIDGE AND DISTRICT HOSPITAL GROUP, BIRMINGHAM REGION.

The Corbett Hospital, Stourbridge (114 Beds)

HOUSE OFFICER (medical), pre-registration. Post vacant July, 1958.

Apply Group Secretary, Guest Hospital, Dudley, Worcs.

Wordsley Hospital, near Stourbridge (478 Beds)

SENIOR HOUSE OFFICER (medical). Post vacant end of June, 1958.

Apply, Group Secretary, Guest Hospital, Dudley, Worcs.

The Guest Hospital, Dudley (154 Beds)

SENIOR HOUSE OFFICER (anæsthetics). Post recognised for F.F.A. R.C.S. Successful candidate will be required to visit other hospitals in the Group.

Applications, giving the names of 2 referees, to the Group Secretary, Guest Hospital, Dudley, Worcs.

HOUSE OFFICER (surgical), pre-registration. Post vacant July, 1958.

HOUSE OFFICER (medical), pre-registration. Post vacant July, 1958.

Apply Group Secretary, Guest Hospital, Dudley, Worcs.

DURHAM. DRYBURN HOSPITAL. (309 Beds.) Senior HOUSE OFFICER in Anæsthetics. Post recognised for D.A. and F.F.A.R.C.S. Previous experience in anæsthetics is not essential. Vacant 1st August, 1958.

Apply, with names and addresses of 2 referees, to Group Secretary, Dryburn Hospital, Durham.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. REGISTRAR in Obstetrics and Gynæcology, Peterborough Group of hospitals. Recognised for M.R.C.O.G. in obstetrics, there are 22 gynæcological beds in the Group and 67 obstetric beds. Single accommodation available. Appointment for 1 year, renewable for second year.

Applications, stating age, experience and the names of 3 referees, to Board's Senior Administrative Medical Officer, 117, Chesterton-road, Cambridge, by 11th August, 1958. Candidates invited to visit hospitals by direct arrangement with Hospital Management Committee Secretary, Memorial Hospital, Peterborough.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. SENIOR MEDICAL REGISTRAR, Ipswich and East Suffolk Hospital. Applicants should have good experience in general medicine and a higher qualification. Arrangements are in hand for the final year in post to be occupied on secondment to a teaching hospital in London.

Applications, stating age, experience and names of 3 referees, to Board's Senior Administrative Medical Officer, 117, Chesterton-road, Cambridge, by 4th August, 1958. Candidates invited to visit the Hospital by direct arrangement with Hospital Management Committee Secretary, Ipswich and East Suffolk Hospital, Anglesea Road Wing, Ipswich.

EAST GRINSTEAD, SUSSEX. QUEEN VICTORIA HOSPITAL. (PLASTIC SURGERY AND JAW INJURIES UNIT.) TUNBRIDGE WELLS GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE OFFICER required. Appointment vacant 1st August, 1958, for 6 months, offering considerable opportunity to gain experience in plastic surgery and jaw injuries work.

Apply, stating age, and names of 3 referees, to Hospital Secretary.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. Appointment of RESIDENT HOUSE SURGEON (third post). Vacant 1st August, 1958. Post provides experience and duties in both general surgery and orthopædics. 6 months' appointment. Post recognised for F.R.C.S. by the Royal College of Surgeons.

Applications, with the names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee, at Chase Farm Hospital.

ENFIELD. WAR MEMORIAL HOSPITAL, Chase Side, ENFIELD, MIDDLESEX. RESIDENT SENIOR HOUSE OFFICER required immediately for general medical and surgical duties in acute general hospital of 61 Beds. 12 months' appointment.

Applications, with names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee, Chase Farm Hospital, The Ridgeway, Enfield, Middlesex.

EPSOM DISTRICT HOSPITAL, Dorking-road, Epsom, SURREY. RESIDENT HOUSE SURGEON required 28th July for Orthopædic, E.N.T and Eye Departments. Pre-registration post recognised for F.R.C.S.

Applications, stating age, qualifications and experience, with copies of 2 recent testimonials, should be sent as soon as possible to Group Secretary at above address.

EPSOM DISTRICT HOSPITAL, Dorking-road, Epsom, SURREY. RESIDENT HOUSE SURGEON required 12th August for General Surgery. Pre-registration post recognised for F.R.C.S.

Applications, stating age, qualifications and experience, with copies of 2 recent testimonials, should be sent as soon as possible to Group Secretary at above address.

FARNBOROUGH HOSPITAL, Farnborough, Kent. (800 Beds.) SENIOR HOUSE OFFICER (E.N.T.) required 1st September. Recognised for F.R.C.S. and D.L.O. Valuable experience in all aspects of E.N.T. work.

Apply stating age, qualifications with dates, experience, and naming 3 referees, to Administrative Officer by 1st August.

FARNBOROUGH HOSPITAL, Kent. (800 Beds.) House SURGEON required 5th September. Recognised for F.R.C.S. Pre-registration post.

Apply, stating age, qualifications with dates, experience, and naming 3 referees, to Administrative Officer by 7th August, 1958. (Ref. H.S.)

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (704 Beds.) Locum CASUALTY REGISTRAR required at above Hospital from 4th to 17th August, 1958, inclusive.

Apply immediately to Medical Administrator, telephone EDGware 2381.

EDINBURGH NORTHERN GROUP OF HOSPITALS. RESIDENT ANÆSTHETIST required for Leith Hospital, commencing 1st October, 1958. Salary scale £467 10s.–£577 10s. p.a. This post is recognised for the Diploma in Anæsthetics.

Applications, with the names of 2 referees, to the Medical Superintendent, Western General Hospital, Edinburgh, 4.

GATESHEAD AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following posts which may be filled by Senior House Officer, House Officer, or pre-registration candidates :—

3 HOUSE PHYSICIANS.
3 HOUSE SURGEONS.

Applications should be sent to the Medical Superintendent, Queen Elizabeth Hospital, Gateshead, 9.

GLASGOW NORTHERN HOSPITALS BOARD OF MANAGEMENT. Applications are invited for the post of SENIOR HOUSE OFFICER in Medicine at Western District Hospital, Glasgow, which becomes vacant on 1st August, 1958. The appointment will be for 1 year in the first instance.

Applications, stating age, qualifications, experience and present appointment and naming 2 referees, to be lodged with the Secretary, 13, Woodside-place, Glasgow, C.3, immediately.

GLASGOW ROYAL INFIRMARY. Senior House Officer in Urology. Duties at above Infirmary.

Write, giving 3 names for reference, not later than 31st July, 1958, to the Secretary, Board of Management for Glasgow Royal Infirmary and Associated Hospitals, 135, Buchanan-street, Glasgow, C.1.

GLASGOW. VICTORIA INFIRMARY. Applications are invited for the post of SENIOR HOUSE OFFICER in Orthopædics for duties at the Victoria Infirmary and a large unit at the Victoria Auxiliary Infirmary, Philipshill. The post is resident at Philipshill.

Applications, with names of 2 referees, should be sent forthwith to the Secretary, Board of Management for Glasgow Victoria Hospitals, 24, St. Vincent-place, Glasgow, C.1.

GODALMING, SURREY. KING GEORGE V HOSPITAL. SENIOR HOUSE OFFICER (resident). Salary and deductions for board, lodging, &c., in accordance with the national scale (£819 10s.). All modern forms of treatment carried out, including major thoracic surgery, a proportion of the beds being set aside for non-tuberculous chest cases, both medical and surgical. The Hospital is associated with a chest clinic.

Apply, giving names and addresses of 3 referees, to the Physician-Superintendent by not later than 15th August, 1958.

GRIMSBY GENERAL HOSPITAL. Senior House Officer required for Casualty Department. Establishment consists of Senior Casualty Officer and 2 Senior House Officers. Excellent medical library taking principal periodicals.

Applications, with names of 2 referees, to Hospital Secretary.

GRIMSBY MATERNITY HOSPITAL. (54 Beds. Recognised for training for D.Obst.R.C.O.G.) SENIOR HOUSE OFFICER (obstetrics) with some gynæcological and neonatal pædiatric duties, to be resident at the above Hospital from mid-August. Appointment for 1 year in first instance.

Applications, stating age, nationality, qualifications and previous appointments with dates, and naming 3 referees, should be sent as soon as possible to Hospital Secretary, Grimsby Maternity Hospital, c/o 3, Queens-parade, Grimsby, Lincs.

GRIMSBY. SCARTHO ROAD HOSPITAL. Grimsby HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE OFFICER (surgical) required (pre-registration or Senior House Officer grade) for duties in acute surgical unit of 56 Beds, modern theatre and Outpatient Department. Offers excellent experience of all types of general surgery. Married quarters may be available if required.

Applications, with names of 2 referees, to the Hospital Secretary.

GUILDFORD GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in Pathology to work in the Group Pathological Laboratory at St. Luke's Hospital and the Laboratory of the Royal Surrey County Hospital. The Group Laboratory is recognised for training for the Diploma in Pathology. Candidates may visit the Laboratories by arrangement.

Application forms from Group Secretary, Guildford Group Hospital Management Committee, St. Luke's Hospital, Guildford, to whom they should be returned by 2nd August, 1958.

GUILDFORD. ROYAL SURREY COUNTY HOSPITAL. (233 Beds.) SENIOR HOUSE OFFICER for Ophthalmology; post vacant on 19th August; resident accommodation available. It is tenable for 6 months and renewable. Recognised for F.R.C.S. and D.O. examinations.

Apply as soon as possible, with copies of 3 testimonials, to Hospital Secretary.

HALIFAX. ROYAL HALIFAX INFIRMARY. (301 Beds.) SENIOR HOUSE OFFICER in General Surgery required. Post vacant on 1st August, 1958. Salary £819 10s. p.a. with deduction of £150 p.a. for board-residence, &c.

Applications to the Group Secretary.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) Locum SENIOR HOUSE OFFICER required for Casualty Department from 2nd August.

Apply to Administrator, Royal East Sussex Hospital, Hastings.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) HOUSE SURGEON. Pre-registration post for general surgery and urology required at this acute hospital (surgical) immediately.

Applications, with names of 2 referees, to Administrator.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) Applications are invited for the post of CASUALTY AND ORTHOPÆDIC HOUSE SURGEON, 1 of 2 similar posts, graded Senior House Officer, for the Royal East Sussex Hospital, Hastings. Modern department. Hospital is pleasantly situated facing the sea. Post vacant 2nd August, 1958.

Applications, with names of 2 referees, to the Administrator at above Hospital.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) Applications are invited for the post of CASUALTY AND ORTHOPÆDIC HOUSE SURGEON, 1 of 2 similar posts, graded Senior House Officer, for the Royal East Sussex Hospital, Hastings. Modern department. Post vacant 9th August, 1958.

Applications, with names of 2 referees, to the Administrator at the above Hospital.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) Applications are invited for the post of HOUSE SURGEON at the Royal East Sussex Hospital, Hastings. Pre-registration post recognised for F.R.C.S. Vacant 26th July, 1958. The Hospital is pleasantly situated facing the sea and is the main surgical hospital in the Hastings Group. Post offers excellent experience.

Applications, with names of 2 referees, to the Administrator.

HARROW CHEST CLINIC, 199, Station-road, Harrow, MIDDLESEX. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time REGISTRAR in Chest Diseases required at above Clinic. Duties will include supervision of beds at Edgware General Hospital. Good training in general medicine essential and some experience in chest diseases desirable. Clinic may be visited by direct appointment.

Application forms obtainable from and returnable to Group Secretary, Hendon Group Hospital Management Committee, Edgware General Hospital, Edgware, Middlesex, by 26th July, 1958.

HEMEL HEMPSTEAD, HERTFORDSHIRE. WEST HERTS HOSPITAL. 2 HOUSE SURGEONS (pre-registration) required.

Applications, giving full details and 2 names for reference, should be sent to the Hospital Secretary as soon as possible.

HEMEL HEMPSTEAD. ST. PAUL'S AND WEST HERTS HOSPITALS. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR in Obstetrics and Gynæcology (resident) required at above Hospitals, which may be visited by direct appointment.

Application form obtainable from and returnable to Group Secretary, West Herts Group Hospital Management Committee, 9, Rickmansworth-road, Watford, Herts, by not later than 29th July, 1958.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) Applications are invited for appointment of RESIDENT HOUSE PHYSICIAN (Male or Female), second post held. Recognised pre-registration post. Preference given to applicants who have held resident surgical or medical posts in general hospital. Duties to commence 18th August, 1958.

Applications to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) Applications are invited for the appointment of HOUSE SURGEON (general, first or second post) to commence as soon as possible. Pre-registration post; recognised under F.R.C.S. regulations. Applications will also be considered from fully registered practitioners.

Applications to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HIGH WYCOMBE, BUCKINGHAMSHIRE. WAR MEMORIAL HOSPITAL. (100 Beds.) SENIOR RESIDENT HOUSE PHYSICIAN required immediately.

Apply, with copies of testimonials or names of 2 referees, to the Secretary.

HITCHIN, HERTFORDSHIRE. LISTER HOSPITAL. CASUALTY OFFICER required for duty with Accident Service and as Orthopædic House Surgeon. Grading up to Senior House Officer, depending on experience, and recognised as pre-registration post and for F.R.C.S. accordingly.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to the Medical Administrator, Lister Hospital, as soon as possible.

HUDDERSFIELD. MILL HILL HOSPITAL. (164 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT MEDICAL OFFICER (Junior Hospital Medical Officer grade, £852 10s.–£55–£1182 10s. p.a.) at above Hospital. The present allocation of beds is 28 for infectious diseases and 136 for geriatric patients.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Group Secretary,
Huddersfield Hospital Management Committee.
The Royal Infirmary, Huddersfield.

HUDDERSFIELD ROYAL INFIRMARY. (285 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from provisionally registered medical practitioners for the post of HOUSE PHYSICIAN to commence duties immediately. Salary in accordance with national scale.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Group Secretary,
Huddersfield Hospital Management Committee.
The Royal Infirmary, Huddersfield.

HUDDERSFIELD ROYAL INFIRMARY. (285 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required to commence duty on 6th August, 1958. The post is recognised as a pre-registration appointment and for the F.R.C.S. Salary in accordance with national scale.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.
The Royal Infirmary, Huddersfield.

HORNCHURCH. ST. GEORGE'S HOSPITAL. Junior HOSPITAL MEDICAL OFFICER (resident) required from approximately 1st September next at this Hospital which accommodates 404 chronic sick patients. The post offers excellent geriatric experience.

Applications should be forwarded to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford, as soon as possible.

HORSHAM. ROFFEY PARK REHABILITATION CENTRE. (117 Beds for those suffering from industrial neuroses.) Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER (Psychiatrist).

Applications, giving age, qualifications, experience and names of 3 referees, should be sent to Secretary, Roffey Park Hospital Management Committee, Roffey Park, Horsham, Sussex, by 31st July, 1958.

HULL. KINGSTON GENERAL HOSPITAL. (419 Beds.) HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE.

(i) SENIOR HOUSE SURGEON (vacant mid-September).
(ii) HOUSE SURGEON (vacant now).

Recognised for the F.R.C.S. examinations.

Applications are invited for the above posts in a busy acute general surgical unit.

Applications, with 2 recent testimonials, to the Hospital Secretary.

HULL. KINGSTON GENERAL HOSPITAL. (419 Beds.) HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT HOUSE PHYSICIAN (pre-registration post). Vacant mid-July.

Applications, with 2 recent testimonials, to the Hospital Secretary.

HULL. VICTORIA HOSPITAL FOR SICK CHILDREN, Park-street. (115 Beds.) SENIOR HOUSE OFFICER required in August, 1958. Duties are those of Casualty Officer and offers good experience. The successful candidate will be expected to supervise the other Junior House Officers.

Apply, giving testimonials, to the Hospital Secretary, at the above address.

HULL. VICTORIA HOSPITAL FOR SICK CHILDREN, Park-street. HOUSE SURGEON required on 1st August, 1958. Pre-registration or registration post. Recognised for D.C.H. An interesting and varied post which includes out-patient and casualty work.

Applications, together with details of experience, testimonials, &c., to the Hospital Secretary.

HUNTINGDON COUNTY HOSPITAL. Applications are invited for the post of HOUSE OFFICER (medical), vacant early August. Post recognised for pre-registration purposes. The selected candidate will be required to look after medical and pædiatric cases and may be called upon to give emergency anæsthetics.

Apply, with full particulars and names of 2 referees, to Secretary, County Hospital, Huntingdon.

IPSWICH. ST. HELEN'S HOSPITAL. (129 Beds for infectious diseases, pulmonary tuberculosis, long-stay orthopædics and geriatrics. The area Chest Clinic is in the Hospital.) HOUSE PHYSICIAN required (post-registration appointment). Accommodation available for married man.

Applications to JOHN WILLIAMS, Group Secretary, Ipswich Group Hospital Management Committee, at the Ipswich and East Suffolk Hospital (Anglesea Road Wing), Ipswich.

KETTERING AND DISTRICT GENERAL HOSPITAL. CASUALTY OFFICER (Senior House Officer). Recognised for F.R.C.S. The post, vacant early September, 1958, offers wide experience of all traumatic conditions including fractures and some orthopædic cases, with charge of 30 Beds.

Applications, accompanied by testimonials, to be sent to the Group Secretary, General Hospital, Kettering.

KINGSTON HOSPITAL, Wolverton-avenue, Kingston UPON THAMES. Applications are invited from suitably qualified and experienced medical officers for the post of CASUALTY REGISTRAR (full-time) at Kingston Hospital. Commencing 8th September, 1958. Duties are daily from 9.30 A.M. to 5.30 P.M. and 1 night duty each week. Except for duty night the post is non-resident, but quarters are available if desired. The post is recognised for F.R.C.S. purposes.

Forms of application may be obtained from the Group Secretary, Kingston Group Hospital Management Committee, 35, Coombe-road, Kingston upon Thames, to whom they should be returned as soon as possible.

LANCASTER MOOR HOSPITAL, Lancaster. (Regional MENTAL HOSPITAL.) Applications are invited for the post of RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER (Male or Female). Accommodation available for single or married candidates. The Hospital serves North Lancashire and the Lake District, is recognised for the D.P.M., and all facilities will be given for taking this examination. All modern methods of investigation and treatment are carried out and opportunity will be given to successful candidates to attend outpatients and become acquainted with up-to-date psychological and electro-encephalographic investigations. The post is for an initial period of 4 years, but renewable if service is satisfactory.

Apply to the Medical Superintendent, giving names of 2 referees, within 2 weeks of the appearance of this advertisement.

LEAMINGTON SPA. WARNEFORD GENERAL HOS-PITAL. (197 Beds.) RESIDENT HOUSE SURGEON (general surgery). Post vacant. Recognised for pre-registration and F.R.C.S. Post provides excellent experience, good accommodation available.

Applications, with 2 recent testimonials, to Hospital Secretary.

LEEDS. THE UNITED LEEDS HOSPITALS. THE GENERAL INFIRMARY AT LEEDS. REGISTRAR in Orthopædic Surgery required. Terms and conditions of service for medical and dental staff apply. Post tenable for 1 year in first instance.

Applications, stating age, experience, qualifications and 3 names for reference, to be sent to the Sub-dean, School of Medicine, Leeds, 2, by not later than 31st July, 1958.

LEEDS. THE UNITED LEEDS HOSPITALS. THE GENERAL INFIRMARY AT LEEDS. Applications are invited for the post of HOUSE SURGEON (pre-registration) to the Genito-urinary Department. Applications will be considered from candidates who have completed pre-registration, in which case the post will be paid at Senior House Officer level.

Applications, stating age, qualifications, experience and 3 names for reference, to be sent to the Secretary of the Board, The General Infirmary, Leeds, 1, as soon as possible.

LEEDS (near). WOODLANDS ORTHOPÆDIC HOS-PITAL, RAWDON, near LEEDS. (112 Beds.) SENIOR HOUSE OFFICER (resident) required. Post vacant 1st October, 1958.

Applications, stating age and experience, with copies of 2 testimonials, to the Secretary, The Royal Infirmary, Bradford, 9, Yorkshire.

LEICESTER. GENERAL HOSPITAL. (Post recognised for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT SURGICAL REGISTRAR required 15th September approximately. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 28th July, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

LIVERPOOL, 9. AINTREE HOSPITAL. Fazakerley GROUP OF HOSPITALS MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER (surgical). Applications are invited from registered medical practitioners. The Hospital is for the treatment of pulmonary and non-pulmonary tuberculosis, and is a main centre for thoracic surgery and has an Orthopædic Department. Salary will be in accordance with terms and conditions of service for hospital medical staff.

Applications, endorsed "Resident Senior House Officer", to be submitted immediately to the Physician-Superintendent.

LLWYNYPIA HOSPITAL, Llwynypia, Rhondda. (200 Beds, including acute medical and chronic sick beds. Serving area population of 112,000.)

(i) SENIOR HOUSE OFFICER (medicine).
(ii) HOUSE OFFICER (medicine).

Person appointed will also be required to undertake duties at the Glyncornel Hospital (56 chronic beds) and Tyntyla Isolation Hospital (42 Beds).

Applications, stating age, qualifications and experience, together with copies of 2 testimonials, to be sent immediately to the Group Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd.

LOUTH, LINCOLNSHIRE. COUNTY HOSPITAL. (215 Beds.) GRIMSBY HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (surgical), vacant middle of August, 1958, at this General Hospital.

Applications, giving full details, together with the names of 2 referees, should be addressed to the Hospital Secretary.

LOUTH, LINCOLNSHIRE. COUNTY HOSPITAL. (215 Beds.) GRIMSBY HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (surgical). Applications are invited for this pre-registration post, vacant middle of August, 1958.

Applications, giving full details, together with the names of 2 referees, should be addressed to the Hospital Secretary.

LOWESTOFT AND NORTH SUFFOLK HOSPITAL, LOWESTOFT. (98 Beds.) HOUSE PHYSICIAN (House Officer or Senior House Officer status). Post vacant early August; recognised for pre-registration service, and the Hospital is regularly visited by Consultant staff from the Norfolk and Norwich Hospital. The applicants should be willing to give anæsthetics of a simple nature when required. Membership of a medical defence society is a condition of appointment.

Applications, giving full details with names of 2 referees, to Hospital Secretary.

LUTON AND DUNSTABLE HOSPITAL. Children's ANNEXE, LUTON, BEDFORDSHIRE. PÆDIATRIC HOUSE OFFICER required. The post is recognised for the D.C.H. and as a second pre-registration post in medicine. The duties include both medical and surgical wards.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to the Secretary, Luton and Hitchin Group Hospital Management Committee, St. Mary's Hospital, Luton.

MACCLESFIELD HOSPITAL—West Park Branch. (204 Beds.) Applications invited Resident Pre-registration HOUSE OFFICER post (general medicine). Department has 62 acute beds. Excellent opportunities for gaining valuable experience.

Apply immediately, with full particulars and names of 2 referees, to Group Secretary, Macclesfield and District Hospital Management Committee, "Willerby House," Cumberland-street, Macclesfield.

MAIDENHEAD HOSPITAL, Berkshire. Applications invited for post of HOUSE SURGEON, vacant now. Pre-registration post.

Applications, stating age, qualifications and nationality, with names of 3 referees, to Secretary.

MAIDENHEAD HOSPITAL, Berkshire. Applications invited for the post of CASUALTY OFFICER (Senior House Officer grade), vacant now. Recognised for F.R.C.S.

Applications, stating age, qualifications, experience and nationality, with copies of testimonials or names of 3 referees, to Secretary.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT CLINICAL PATHOLOGIST (Senior House Officer grade) which will become vacant on 1st September, 1958. Previous experience in pathology not essential, the post affording opportunities for gaining experience in all branches of clinical pathology.

Applications, stating age, qualifications, present post, experience and the names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20.

MANCHESTER. BOOTH HALL CHILDREN'S HOSPITAL, BLACKLEY, MANCHESTER, 9. (380 Beds. Recognised for D.C.H.) RESIDENT SENIOR HOUSE OFFICER (surgical). Duties orthopædic and E.N.T. Post vacant 1st August.

Applications, giving names and addresses of 2 referees, to be sent to Group Secretary, from whom further particulars may be obtained.

MANCHESTER. BOOTH HALL CHILDREN'S HOSPITAL, BLACKLEY, MANCHESTER 9. (380 Beds.) Applications are invited for the post of RESIDENT CLINICAL PATHOLOGIST, Senior House Officer grade, which will become vacant during August, 1958. The post, which is tenable for 1 year, affords opportunities for training in all branches of pathology. Candidates should have held house appointments, but previous experience in pathology is not essential.

Application form from Group Secretary.

MANCHESTER. BOOTH HALL CHILDREN'S HOSPITAL, BLACKLEY, MANCHESTER, 9. (380 Beds. Recognised for D.C.H.) RESIDENT SENIOR HOUSE OFFICER (general surgery).

Applications, giving names and addresses of 2 referees, to be sent to Group Secretary, from whom further particulars may be obtained.

MANCHESTER. NORTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. The following Pre-registration HOUSE OFFICER posts fall vacant on 1st August, 1958 :—

Ancoats Hospital—surgery and orthopædics.

Manchester Victoria Memorial Jewish Hospital—surgery.

Applications, with names of 2 referees, to the Group Secretary, Crumpsall Hospital, Manchester, 8, by 24th July, 1958.

MANCHESTER REGIONAL HOSPITAL BOARD. Bolton DISTRICT GENERAL HOSPITAL. (607 Beds, including 107 for obstetrics and 45 for gynæcology.) RESIDENT REGISTRAR in Obstetrics and Gynæcology. Recognised for M.R.C.O.G. and D.Obst.R.C.O.G.

Applications, stating age, nationality, qualifications, experience and the names of 2 referees, to Group Secretary, Bolton and District Hospital Management Committee, The Royal Infirmary, Bolton.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of REGISTRAR in Orthopædic Surgery to the Blackpool and Fylde Group of hospitals, with main duties at Victoria Hospital, Blackpool. There are 65 orthopædic beds in the group and busy outpatient clinics. Ample scope for gaining experience in all aspects of the work of the department. Post recognised for F.R.C.S. examination and vacant from 21st July, 1958. A furnished flat is available in the married quarters situated in a detached property in a select residential area adjacent to the Hospital.

Applications, stating age, qualifications, experience and the names and addresses of 3 referees, should be sent to the Group Secretary, Blackpool and Fylde Hospital Management Committee, Victoria Hospital, Blackpool.

MANCHESTER REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time post of REGISTRAR in Chest Diseases in Ashton, Hyde and Glossop Group and Oldham and District Group of hospitals. The post offers wide experience in both outpatient clinics and pulmonary hospitals.

Applications, stating age, nationality, qualifications and experience, with copies of 2 references, should be forwarded to the Group Secretary, Ashton-under-Lyne General Hospital Ashton-under-Lyne, Lancashire, as soon as possible.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL EYE HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER.

Application forms may be obtained from the undersigned.

H. R. NORTH, General Superintendent.

Manchester Royal Eye Hospital.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL EYE HOSPITAL. Applications are invited for the post of RESIDENT SURGICAL OFFICER (Registrar grade).

Application forms may be obtained from the undersigned.

H. R. NORTH, General Superintendent.

Manchester Royal Eye Hospital.

MANCHESTER, 23. WYTHENSHAWE HOSPITAL. SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT CLINICAL PATHOLOGIST (Senior House Officer grade). The post offers opportunity for training in all branches of pathology. Previous experience is not required.

Apply, with full details and the names of 2 referees, to the Group Secretary, Withington Hospital, Manchester, 20.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE SURGEON. 6 months' appointment. Vacant now. Recognised for F.R.C.S. Salary at the rate of £467 10s.–£577 10s. p.a. A deduction at the rate of £125 a year is made for board and lodging, and other services provided.

Applications should be forwarded, as soon as possible, to the Administrative Officer at the Hospital.

MORECAMBE. QUEEN VICTORIA HOSPITAL. Resident SENIOR HOUSE OFFICER (surgical). The post is normally tenable 1 year and the successful applicant will be attached to the specialist surgical unit.

Applications, with names of 2 referees, to Group Secretary, Royal Lancaster Infirmary, Lancaster.

MEXBOROUGH. MONTAGU HOSPITAL AND ANNEXE. (198 Beds.) Locum SENIOR HOUSE OFFICER (casualty and orthopædics). £150 p.a. residential emoluments.

Applications to the Secretary to the Committee, "Fern Bank", Doncaster-road, Rotherham.

MEXBOROUGH. MONTAGU HOSPITAL AND ANNEXE. (168 Beds and 30 Beds.) RESIDENT HOUSE SURGEON.

Applications to the Secretary, Hospital Management Committee, "Fern Bank", Doncaster-road, Rotherham.

MEXBOROUGH. MONTAGU HOSPITAL AND ANNEXE. (168 Beds and 30 Beds.) RESIDENT HOUSE PHYSICIAN.

Applications to the Secretary, Hospital Management Committee, "Fern Bank", Doncaster-road, Rotherham.

MITCHAM. WILSON HOSPITAL, Cranmer-road, MITCHAM, SURREY. RESIDENT HOUSE PHYSICIAN (not pre-registration). Vacant now.

Applications, stating age, qualifications, &c., with the names and addresses of 2 referees, to the Secretary at above address.

MORPETH (near). MONA TAYLOR MATERNITY HOSPITAL, STANNINGTON, near MORPETH, NORTHUMBERLAND. (26 Beds.) RESIDENT SENIOR HOUSE OFFICER (obstetrics) required 1st September. Unfurnished semi-detached house available for married officer.

Applications, stating age, nationality and full particulars of qualifications and experience, together with the names of 2 referees, should be forwarded to the Group Secretary, Wansbeck Hospital Management Committee, 12, Stanley-street, Blyth, Northumberland.

NEWCASTLE REGIONAL HOSPITAL BOARD. Registrar ANÆSTHETIST, whole-time, Newcastle upon Tyne Group of hospitals—Newcastle General Hospital (835 Beds, including special units, i.e., neurosurgical, plastic surgery, &c.). Recognised for F.F.A.R.C.S. Post available 1st October, 1958. Single accommodation available.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Senior REGISTRAR SURGEON (whole-time), Newcastle upon Tyne Group of hospitals for Urology Unit (50 Beds), Newcastle General Hospital (835 Beds). Appointment suitable for Senior Registrar who has completed general surgical training and requires 1/2 years only in this specialty. Post available from 1st October, 1958, for 1 year initially.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Senior REGISTRAR OPHTHALMOLOGIST, whole-time, for Newcastle upon Tyne Group of hospitals. Main hospitals Newcastle General (835 Beds), Walker Gate (309 Beds—42 ophthalmic), Walker Accident (21 ophthalmic beds). Candidates should hold D.O. or D.O.M.S.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Locum REGISTRAR OBSTETRICIAN AND GYNÆCOLOGIST, whole-time, for North West Durham Group of hospitals for approximately 4 months from 1st September, 1958.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Registrar ORTHOPÆDIC SURGEON, whole-time, Sunderland Orthopædic and Accident Hospital (120 Beds) and Grindon Hall Hospital (50 long-stay beds). Post recognised as a casualty appointment for F.R.C.S. and suitable for person working for primary or final examination. Arrangements can be made for appointee to attend postgraduate lectures and demonstrations in anatomy and physiology at medical schools, Newcastle. Post available end of September.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWPORT AND EAST MONMOUTHSHIRE GROUP. Pre-registration HOUSE OFFICER posts are available about 1st August :—

Royal Gwent Hospital, Newport (260 Beds)
1 surgical (recognised F.R.C.S.).
1 gynæcological.

St. Woolos Hospital, Newport (379 Beds)
1 medical.
1 surgical (recognised F.R.C.S.).

Pontypool and District Hospital (126 Beds)
1 medical (includes pædiatrics).

Write, quoting 2 referees, and post preferred, to T. A. JONES, Group Secretary, 64, Cardiff-road, Newport, Mon.

NOTTINGHAM CITY HOSPITAL. (811 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (general surgery) vacant early August. The post is approved for the F.R.C.S. The officer appointed will also be required to undertake certain duties in the Orthopædic Department. A deduction of £150 p.a. will be made for residential emoluments.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be sent to the Hospital Secretary, City Hopsital, Hucknall-road, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Senior House OFFICER (surgery) required. Duties to commence 26th July, 1958.

Applications, stating age, qualifications, experience and nationality, together with copies of testimonials, to be sent to Group Secretary, General Hospital, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER (casualty), duties to commence about 26th July. Establishment 3. Recognised for F.R.C.S. Post offers wide experience of casualty work.

Applications, stating age, nationality, qualifications and experience, together with copies of testimonials, to be sent to the Secretary, General Hospital, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Resident Pre-registration HOUSE SURGEONS required. Posts vacant July.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to Group Secretary.

NORWICH. NORFOLK AND NORWICH HOSPITAL. Applications are invited for the following appointments vacant 1st August, 1958:—

SENIOR CASUALTY OFFICER AND HOUSE SURGEON to the Septic Block. Senior House Officer status. 2 Casualty Officers employed in the Department. Post recognised for final F.R.C.S. examination requirements.

SENIOR ORTHOPÆDIC HOUSE SURGEON. Senior House Officer status. 2 House Officers employed in the Department. Post recognised for final F.R.C.S. examination requirements.

Membership of a Medical Defence Society is a condition of appointment in each case.

Applications, giving full details with names of 2 referees, to Group Secretary, Hospital Management Committee, St. Stephen's-road, Norwich.

NORWICH. NORFOLK AND NORWICH HOSPITAL. Applications are invited for the following appointments vacant 1st August, 1958. These are pre-registration posts :—

JUNIOR CASUALTY OFFICER. 2 Casualty Officers employed in the Department.

JUNIOR ORTHOPÆDIC HOUSE SURGEON. 2 Orthopædic House Officers employed in the Department.

HOUSE PHYSICIAN at the West Norwich Hospital. Duties include medical and geriatrics. The beds at this Hospital are under the control of the Consultant Physicians of the Norfolk and Norwich Hospital, and the successful candidate will be required to undertake medical duties under their supervision.

HOUSE SURGEON at the West Norwich Hospital. Post recognised for final F.R.C.S. examination requirements. Duties general surgical and including burns and plastic work. The beds at this Hospital are under the control of the Consultant Staff of the Norfolk and Norwich Hospital.

Membership of a Medical Defence Society is a condition of appointment in each case.

Applications, giving full details with names of 2 referees, to Group Secretary, Hospital Management Committee, St. Stephen's road, Norwich.

NORWICH. WEST NORWICH HOSPITAL, Bowthorpe-road. Locum SURGICAL REGISTRAR required for 3 months from 24th August, 1958, whilst permanent holder of post is on study leave. Resident or non-resident. Salary £26 8s. per week in accordance with terms and conditions of service of Hospital Medical Staff. Membership of a Medical Defence Society is a condition of appointment.

Applications, stating age, qualifications and experience together with names of 2 referees, to Group Secretary, Hospital Management Committee, St. Stephen's-road, Norwich.

OXFORD REGIONAL HOSPITAL BOARD. Registrar in Psychiatry to St. Crispin Hospital, Duston, Northampton (1100 Beds). Single accommodation. Post vacant now. Good training facilities including Electroencephalographic Department and child guidance work.

Applications, on forms obtainable from the Secretary, Registrars Committee, 43, Banbury-road, Oxford, should reach him by 4th August.

OXFORD REGIONAL HOSPITAL BOARD. Registrar in Obstetrics and Gynæcology (resident) to the Area Department of Obstetrics and Gynæcology, Reading Combined Hospitals (100 Beds). Post recognised for M.R.C.O.G. Vacant 1st October. Unfurnished married or unfurnished single accommodation available. The appointment will be for 1 year and is eligible for extension to 2 years.

Applications, on forms obtainable from the Secretary, Registrars Committee, 43, Banbury-road, Oxford, to reach him by 2nd August.

PAISLEY HOSPITALS MATERNITY UNIT. (Thornhill AND BARSHAW MATERNITY HOSPITALS.) Applications are invited from registered and provisionally registered medical practitioners for 2 RESIDENT HOUSE SURGEON posts (obstetrics). Posts become vacant on 1st August, 1958.

Applications to Group Medical Superintendent, Royal Alexandra Infirmary, Paisley.

PAISLEY. ROYAL ALEXANDRA INFIRMARY. House SURGEON (orthopædic) required for above Infirmary as from 1st August, 1958. Post approved for pre-registration practitioners and F.R.C.S.

Applications to Group Medical Superintendent.

PAISLEY. ROYAL ALEXANDRA INFIRMARY. House SURGEONS (general) required for above Infirmary as from 1st August, 1958. Posts approved for pre-registration practitioners and F.R.C.S.

Applications to Group Medical Superintendent.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.

Queen Alexandra Hospital

General Medicine and Dermatology (78 medical beds and 24 dermatology beds)

SENIOR HOUSE OFFICER. Vacant now.

Royal Portsmouth Hospital

Orthopædic (104 orthopædic beds)

SENIOR HOUSE OFFICER. Vacant 2nd August, 1958.

HOUSE OFFICER (pre-registration). Vacant now.

Pædiatric and Medical (30 Beds)

HOUSE OFFICER (pre-registration). Vacant 12th August, 1958.

Saint Mary's Hospital

Surgery (120 surgical beds)

HOUSE OFFICERS (3) (pre-registration). Vacant now, 9th August, 1958, and 12th August, 1958.

Applications, stating age, experience and qualifications, together with the names of 2 referees, should be forwarded as soon as possible to E. H. HURST, St. Mary's Hospital, Milton-road, Portsmouth.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL, FREEDOM FIELDS. Central Casualty Department. RESIDENT SENIOR HOUSE OFFICER in Casualty, vacant immediately. Recognised for the F.R.C.S.

Applications, with names of 3 referees, to be sent to the Group Secretary.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL.

SENIOR HOUSE OFFICER in Anæsthetics, vacant September, 1958. Recognised for the D.A. and F.F.A. R.C.S.

HOUSE SURGEONS, pre-registration posts (2) both vacant immediately. Recognised for the F.R.C.S. Greenbank Road Hospital.

In all cases send names of 3 referees, also stating age, nationality, qualifications and experience, to the Group Secretary, 7, Nelson-gardens, Stoke, Plymouth.

READING. BATTLE HOSPITAL. (391 Beds.) Reading AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of RESIDENT JUNIOR HOUSE SURGEON (pre- or post-registration) required in the Accident and Orthopædic Department. F.R.C.S. recognised. Also casualty duties. Vacant immediately.

Apply, stating age, qualifications with dates, nationality, present post, with copy of recent testimonial, to Secretary.

REDHILL COUNTY HOSPITAL. House Surgeon. Pre-registration appointment vacant mid-August, recognised for F.R.C.S., and with House Physician's post to follow if required.

Apply Group Secretary, Redhill Hospital Management Committee, Earlswood Mount, Redhill, Surrey.

REDHILL. EAST SURREY HOSPITAL, Shrewsbury-road, REDHILL, SURREY. RESIDENT HOUSE SURGEON (Male). Pre-registration appointment vacant immediately. Opportunity of House Physician's post to follow if required.

Applications to Hospital Secretary.

RICHMOND, SURREY. CASSEL HOSPITAL FOR FUNCTIONAL NERVOUS DISORDERS, SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of part-time (5/11) JUNIOR HOSPITAL MEDICAL OFFICER. Preference given to applicants having experience or interest in psychotherapy and must have special interest in psychoanalysis. Candidates may visit the Hospital by appointment.

Application forms may be obtained from the undersigned and should be returned to the Secretary within 14 days of the appearance of this advertisement. D. MALLION, Secretary,

Cassel Hospital Management Committee.

Ham Common, Richmond.

ROCHDALE AND DISTRICT HOSPITAL MANAGE-MENT COMMITTEE. HOUSE PHYSICIAN required at Birch Hill Hospital. Resident post available in July.

Apply at once to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale, Lancs.

ROCHDALE GROUP OF HOSPITALS. Senior House OFFICER in Anæsthetics required. 1-year appointment recognised for the D.A. Post vacant August.

Applications to the Group Secretary, Birch Hill Hospital, Rochdale.

ROCHESTER, KENT. ST. BARTHOLOMEW'S HOS-PITAL. (Recognised for the F.R.C.S.) MEDWAY AND GRAVESEND HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON. Applications are invited for this pre-registration post in general surgery, vacant now. Salary £467 10s.–£577 10s. p.a., according to experience.

Applications, stating age, qualifications, nationality and experience, to be addressed to the Hospital Secretary.

ROMFORD, ESSEX. RUSH GREEN HOSPITAL. (301 Beds.) RESIDENT SENIOR HOUSE OFFICER in Anæsthetics (Male or Female) required from 1st September, 1958. Resident or non-resident. Post affords good experience ; modern equipment, twin theatre. Recognised for D.A. and F.F.A. R.C.S.

Applications to Medical Superintendent. Hospital may be seen by arrangement. Telephone : Romford 46066.

ROMFORD, ESSEX. VICTORIA HOSPITAL. (99 Beds.) TEMPORARY SURGICAL REGISTRAR (Male) required immediately.

Applications to Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD GROUP HOSPITAL MANAGEMENT COM-MITTEE. CLINICAL ASSISTANT required on the staff of the Regional Ophthalmic Centre at Oldchurch Hospital, Romford, to undertake 1 outpatient session per week, Thursday morning, in the Eye Clinic at Tilbury and Riverside Hospital, Tilbury.

Applications to be sent to Group Secretary, Oldchurch Hospital, Romford, as soon as possible.

ROTHERHAM. MOORGATE GENERAL HOSPITAL. (342 Beds, 38 Cots.) RESIDENT HOUSE PHYSICIAN.

Applications to the Secretary, Hospital Management Committee, " Fern Bank ", Doncaster-road, Rotherham.

ROTHERHAM HOSPITAL, Doncaster-gate. (161 Beds.) MOORGATE GENERAL HOSPITAL, ROTHERHAM. (342 Beds, 38 Cots.) RESIDENT HOUSE SURGEON (Casualty, E.N.T. and Eye Departments).

Applications to the Secretary, Hospital Management Committee, " Fern Bank ", Doncaster-road, Rotherham.

ROTHERHAM HOSPITAL AND ROSEHILL HOSPITAL ANNEXE. (161 Beds and 26 Beds.) RESIDENT HOUSE PHYSICIAN.

Applications to the Secretary, Hospital Management Committee, " Fern Bank ", Doncaster-road, Rotherham.

SALISBURY GENERAL HOSPITAL. Orthopædic Department. Applications are invited for the post of SENIOR RESIDENT HOUSE SURGEON or RESIDENT HOUSE SURGEON, vacant 11th September. Appointment recognised for pre-registration candidates, and also Fellowship regulations. Department has over 50 Beds and large outpatient turnover, dealing with fractures and all types of orthopædic surgery.

Applications, stating age, nationality, qualifications and experience, and naming 2 referees, to the Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

SALISBURY GENERAL HOSPITAL. Applications are invited for the appointment of RESIDENT HOUSE SURGEON/HOUSE PHYSICIAN to run consecutively in this order for a period of 6 months in each post from 19th August. Posts open to pre-registration candidates.

Apply, naming 2 referees, to Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE, SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR to the Orthopædic Department, with effect from 1st October. The post is recognised under fellowship regulations and offers wide practical experience in traumatic and general orthopædics, including children.

Application forms may be obtained from, and must be returned to, Group Secretary, Odstock Hospital, Salisbury, by 30th July.

SALFORD. HOPE HOSPITAL. Salford Hospital Management COMMITTEE. Applications are invited for 2 RESIDENT HOUSE SURGEON posts (pre- or post-registration), which become vacant on the 27th July, 1958. These posts are recognised for the F.R.C.S.

Applications, stating age, qualifications and experience, together with the names and addresses of 2 referees, should be forwarded to the Hospital Secretary immediately.

SCARBOROUGH HOSPITAL. (190 Beds.) Applications are invited for the following HOUSE OFFICER posts for 6 months commencing 1st August, 1958 :—

General surgical (recognised for F.R.C.S.).
Surgical (E.N.T., general orthopædics).
Surgical (midwifery, gynæcology, ophthalmology).

Applications should be forwarded to the Hospital Secretary, Scalby-road, Scarborough.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. 2 REGISTRARS in the Regional Pool of Anæsthetists based on the Royal Infirmary of Edinburgh. The successful candidatess will be seconded for periods of duty in peripheral hospitals, details of which may be obtained on application.

Apply, stating age, qualifications and previous experience, and the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 9th August, 1958.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. REGISTRAR in Surgery, for duties in the first instance at the Royal Hospital for Sick Children, Edinburgh, vacant on 1st October, 1958.

Apply, giving particulars of age, qualifications and previous experience, and the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 2nd August, 1958.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. REGISTRAR in Tuberculosis at Glenlomond Hospital, Kinross.

Apply, giving particulars of age, qualifications and previous experience, and the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 2nd August, 1958.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. REGISTRAR to the Casualty Department, Dunfermline and West Fife Hospital, vacant on 1st September, 1958.

Apply, giving particulars of age, qualifications and previous experience, and the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 2nd August, 1958.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. REGISTRAR in General Medicine in a University Teaching Unit at the Western General Hospital (Edinburgh Northern Group) vacant on 1st October, 1958.

Apply, giving particulars of age, qualifications and previous experience, and the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 2nd August, 1958.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. REGISTRAR in General Medicine to the West Fife Group of hospitals, based on the Northern Hospital, Dunfermline.

Apply, giving particulars of age, qualifications and previous experience, and the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 2nd August, 1958.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. REGISTRAR in General Medicine, Leith Hospital.

Apply, giving particulars of age, qualifications and previous experience, together with the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 2nd August, 1958.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments, which will be for 1 year in the first instance :—

SENIOR REGISTRAR in Ophthalmology based at the Glasgow Ophthalmic Institution.

REGISTRAR in General Surgery with duties on a yearly rotational basis at the Victoria Infirmary, Glasgow, and at the Royal Infirmary, Dumfries. Experience will be obtained in other branches of surgery. Housing accommodation available at Royal Infirmary, Dumfries.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, by 2nd August, 1958.

SHREWSBURY. ROYAL SALOP INFIRMARY/COPTHORNE HOSPITAL. (500 Beds.) HOUSE PHYSICIAN, pre-registration candidates eligible. Vacant 1st August, 1958.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY/COPTHORNE HOSPITAL. (500 Beds.) HOUSE SURGEON. Vacant immediately. Pre-registration candidates eligible. Recognised for the F.R.C.S.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SHREWSBURY. SHELTON HOSPITAL. Shrewsbury HOSPITAL GROUP. Locum REGISTRAR in Psychiatry for above Hospital for approximately 2 months. £19 5s. weekly.

Applications to Medical Superintendent immediately.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Locum ANÆSTHETIC REGISTRAR (whole-time) required for the month of August.

Applications, with full details and names of 2 referees, to Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. CHILDREN'S HOSPITAL. REGISTRAR in Pathology required 1st October, 1958, to work in Department of Pathology and to collaborate in the teaching and research activities of the laboratory.

Applications, with full details and names of 3 referees, to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1, by 31st July, 1958.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. CHILDREN'S HOSPITAL. RESIDENT CLINICAL PATHOLOGIST (Senior House Officer grade) required 1st October, 1958. Post suitable for person training in paediatrics or pathology. Holder expected to attend clinical rounds and meetings and cooperate in research programmes of the department.

Applications, with full details and names of 2 referees, to the Superintendent, Children's Hospital, Western Bank, Sheffield, 10, by 31st July, 1958.

SHOREHAM-BY-SEA, SUSSEX. SOUTHLANDS HOSPITAL. Locum REGISTRAR for Surgical and Orthopædic work required for 4 weeks from 4th August, 1958.

Apply Hospital Secretary, Southlands Hospital (phone : Shoreham by Sea 2381) as soon as possible.

A. V. OAKTON, Group Secretary,
Worthing Group Hospital Management Committee.

SIDCUP, KENT. QUEEN MARY'S HOSPITAL. Senior HOUSE OFFICER (casualty and orthopædics) required 1st August, 1958. The successful applicant will serve 3 months in the Orthopædic Department and 3 months as Casualty Officer. The post is recognised under the Fellowship regulations as one giving the required period of 6 months' casualty training.

Applications, stating age, qualifications and experience, together with names and addresses of 2 referees, should be sent to the Secretary.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. HOUSE SURGEON required, pre-registration post, vacant 29th July. Recognised for F.R.C.S.

Applications, with names of 2 referees, to Secretary.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. HOUSE PHYSICIAN required for post vacant 29th July. Pre-registration appointment offering considerable experience in general acute medical work.

Applications, with names of 2 referees, to Secretary.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. HOUSE SURGEON required in Department of Obstetrics and Gynæcology to work with part-time Registrar. Post not recognised for D.Obst.R.C.O.G.

Applications, with names of 2 referees, to Secretary.

SOUTHEND-ON-SEA GENERAL HOSPITAL. Applications are invited for appointment as SENIOR HOUSE OFFICER to the Orthopædic and Fracture Department. Post vacant 1st August, 1958. The Orthopædic and Fracture Department is the centre for reference of all cases from a large surrounding area, and the post offers excellent experience in all aspects of orthopædic and traumatic surgery under the supervision of and with instruction from the Consultant-in-Charge. Post recognised for the F.R.C.S. Resident or non-resident.

Applications, stating age, qualifications and experience, together with copies of recent testimonials, should be sent to the undersigned by 24th July, 1958. J. C. FIELD, Secretary.

SOUTHPORT GENERAL INFIRMARY. (189 Beds. Recognised for pre-registration and F.R.C.S.) HOUSE SURGEON (general surgery and gynæcology). Post vacant July.

Apply, with 2 copy testimonials, to Group Secretary, Southport and District Hospital Management Committee, Promenade Hospital, Southport.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires temporary Part-time JUNIOR HOSPITAL MEDICAL OFFICER (4 days per week—Monday to Thursday inclusive) for the Blood Transfusion Service of the South West and South East Metropolitan Regions. Duties to accompany blood-taking teams based on Maidstone and operating in Kent. Required for a minimum period of 3 months. Remuneration: Junior Hospital Medical Officer scale, pro rata.

Apply immediately, giving date of birth, qualification, experience, and names of 3 referees, to the Medical Director, South London Blood Supply Depot, Stanley-road, Sutton, Surrey, from whom further particulars may be obtained.

SOUTHAMPTON GENERAL HOSPITAL. (465 Beds. Recognised for the Membership and Diploma examinations for the R.C.O.G.) RESIDENT HOUSE SURGEON to the Gynæcological and Obstetric Unit required mid-August.

Applications, with copies of recent testimonials, should be forwarded as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON GENERAL HOSPITAL. (465 Beds.) RESIDENT HOUSE PHYSICIAN required mid-August. Pre-registration candidates eligible.

Applications, with copies of testimonials, to Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (274 Beds. Recognised for F.R.C.S.) ORTHOPÆDIC HOUSE SURGEON (pre-registration candidates eligible). Post offers excellent experience in the treatment of traumatic conditions.

Applications to Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL (274 Beds) and SOUTHAMPTON GENERAL HOSPITAL (465 Beds). SENIOR HOUSE OFFICER (E.N.T.) required. This post is recognised for the F.R.C.S. (Eng.) and D.L.O. examinations and provides experience in all branches of E.N.T. work. The Group includes a diagnostic and distributing hearing-aid centre.

Applications, with copies of recent testimonials, should be forwarded as soon as possible to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (274 Beds.) RESIDENT HOUSE SURGEONS required mid-August. Pre-registration candidates are eligible. The posts are recognised for F.R.C.S. and offer exceptional opportunities for general experience with a Senior Surgical Registrar in a busy acute unit of 70 Beds.

Applications, with copies of recent testimonials, to Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

ST. ALBANS CITY HOSPITAL. (384 Beds.) North West METROPOLITAN REGIONAL HOSPITAL BOARD. CASUALTY OFFICER (Registrar grade) required. Post recognised for F.R.C.S. regulations. Appointment tenable for 6 months from 1st September, 1958, and subject to review at end of this period.

Application forms obtainable from and returnable to Secretary, Mid Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans, Herts.

ST. ALBANS CITY HOSPITAL. (384 Beds.) North West METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time ANÆSTHETIC REGISTRAR required. Post recognised for F.F.A. R.C.S. and D.A., and vacant about 27th August, 1958. Hospital may be visited by direct appointment.

Application forms obtainable from and returnable to Secretary, Mid Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans, Herts.

ST. ALBANS (near), HERTFORDSHIRE. NAPSBURY HOSPITAL. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. PSYCHIATRIC REGISTRAR, whole-time, required at above Hospital, a large mental hospital with associated outpatient clinics. Some experience in psychiatry desirable. Single accommodation available or a house on the Hospital estate for a married person. Candidates may visit the Hospital by direct appointment.

Application forms obtainable from and returnable to Secretary, Napsbury Hospital Management Committee, Napsbury Hospital, near St. Albans, Herts, by 20th August, 1958.

ST. ALBANS (near), HERTFORDSHIRE. SHENLEY HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER (Psychiatrist), the vacancy arising in mid-July, for 1 year in the first instance, at Shenley Hospital, 16 miles from London. Opportunity for work with neurotic as well as psychotic patients. Successful applicant can live out or can have single accommodation in the Hospital. The Hospital may be visited by appointment.

Applications to the Medical Superintendent.

STAFFORD. STAFFORDSHIRE GENERAL INFIRMARY. (175 Beds—Recovery Unit 32 Beds.) HOUSE SURGEON. Pre-registration post. Vacant 9th July. At end of service the successful applicant will be considered for appointment to a pre-registration post of House Physician if he or she has not held such an appointment.

Applications to Group Secretary, Stafford Hospital Management Committee, 13, Foregate-street, Stafford.

STOCKPORT. STEPPING HILL HOSPITAL. (529 Beds.) Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (Medicine), vacant 18th August, 1958.

Applications, stating age, experience and qualifications, together with copies of 2 testimonials, to be addressed to the Group Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport.

STOCKPORT. STEPPING HILL HOSPITAL. (529 Beds.) Applications are invited for the post of HOUSE OFFICER (general surgery).

Applications, with copies of 2 testimonials, to the Group Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport.

STOCKPORT. STEPPING HILL HOSPITAL. (529 Beds.) Applications are invited for 2 pre-registration posts of HOUSE OFFICER (medicine), vacant 31st July, 1958, and 21st August, 1958.

Applications, with full particulars and copies of 2 testimonials, to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. BIRMINGHAM REGIONAL HOSPITAL BOARD. RESIDENT HOUSE OFFICER (obstetrics and gynæcology) required, vacant towards end of August. Pre-registration post. Recognised for M.R.C.O.G. and D.Obst.R.C.O.G.

Applications to Hospital Secretary as soon as possible.

SULLY HOSPITAL, Sully, Glamorganshire. (Thoracic centre of 324 Beds.) SENIOR HOUSE OFFICER (surgical)—applicants primarily interested in general surgery considered. Experience will be gained in investigation and treatment of chest and heart conditions.

Form of application from Group Secretary, 44, Cathedral-road, Cardiff.

SWINDON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications invited for post of RESIDENT HOUSE SURGEON for general surgical unit of 80 Beds at Victoria Hospital, Swindon. Recognised for F.R.C.S and training under pre-registration internship regulations. Married accommodation is available.

Full details, giving names of 3 referees, to Secretary, 7, Okus-road, Swindon.

SWINDON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for post of RESIDENT HOUSE PHYSICIAN in acute medical unit of 64 Beds at St. Margaret's Hospital. Recognised for training under pre-registration internship regulations.

Full details, with names of 3 referees, to Secretary, 7, Okus-road, Swindon.

SWANSEA HOSPITAL, Swansea. (413 Beds.) Glan-TAWE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of SENIOR HOUSE OFFICER in the Surgical Unit of the above Hospital. Vacancy 24th August, 1958. The post is recognised under the F.R.C.S. (Eng.) regulations.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, should be forwarded to the Secretary of the Hospital.

T. E. JONES, Group Secretary.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE PHYSICIAN required for post vacant 26th August. Pre-registration post.

Applications, stating age, experience and qualifications with dates, and copies of 2 testimonials, to Secretary.

TAUNTON AND SOMERSET HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER (casualty and orthopædic).

Applications, stating age, nationality and qualifications, together with the names of 2 referees, should be forwarded to the Group Secretary, Taunton Hospital Management Committee, Taunton and Somerset Hospital, Musgrove Park Branch, Taunton, Somerset.

TAUNTON AND SOMERSET HOSPITAL, Taunton, SOMERSET. (423 Beds.) HOUSE OFFICER (general surgery) required. Pre-registration post recognised for F.R.C.S., vacant now.

Applications, stating age, nationality and qualifications, to the Group Secretary, Taunton Hospital Management Committee, c/o Musgrove Park Hospital, Taunton.

TORQUAY. TORBAY HOSPITAL. Resident Casualty OFFICER (Senior House Officer status) required August, 1958. Post recognised for F.R.C.S. purposes. There is a complement of 6 Resident House Officers.

Applications, stating qualifications, nationality, age, (quoting Ref. F. 955/86) with copy testimonials, to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

TORQUAY. TORBAY HOSPITAL. (180 general beds.) RESIDENT HOUSE OFFICER (surgical), Male or Female, required early September, 1958. Post recognised for F.R.C.S. and pre-registration purposes. There is a complement of 6 Resident House Officers.

Applications, stating qualifications, nationality, and age, together with copy testimonials (quoting reference F.955/84) to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

TUNBRIDGE WELLS (near). PEMBURY HOSPITAL, PEMBURY, KENT. (357 Beds.) TUNBRIDGE WELLS GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications invited for pre-registration post of ORTHOPÆDIC HOUSE SURGEON. 6 months' appointment. Vacant now.

Apply, giving details of age, experience and qualifications, to Surgeon-Superintendent.

TUNBRIDGE WELLS (near). PEMBURY HOSPITAL, PEMBURY, KENT. (357 Beds.) TUNBRIDGE WELLS GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications invited for pre-registration post of HOUSE SURGEON. 6 months' appointment. Vacant now.

Apply, giving details of age, experience and qualifications, to Surgeon-Superintendent.

WAKEFIELD. CLAYTON HOSPITAL. (207 Beds.) HOUSE SURGEON (general surgery, E.N.T. and ophthalmology) required at above Hospital. Approved pre-registration appointment.

Application forms obtainable from the Group Secretary, Hospital Management Committee, No. 9 Wakefield A Group, 113, Northgate, Wakefield.

WAKEFIELD. CLAYTON HOSPITAL. (207 Beds.) HOUSE SURGEON (general surgery and orthopædics) required at above Hospital. Approved pre-registration appointment.

Application forms obtainable from the Group Secretary, Hospital Management Committee, No. 9 Wakefield A Group, 113, Northgate, Wakefield.

WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL. (Regional Thoracic Centre.) Applications invited for positions of SENIOR HOUSE PHYSICIAN and SENIOR HOUSE SURGEON. Salary £819 10s. p.a. £150 p.a. charged for accommodation.

Address written applications, giving full personal particulars, details of experience and 2 names and addresses for reference, to W. BOWRING, Group Secretary, Pinderfields General Hospital, Wakefield.

WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL. Applications invited for position of SENIOR HOUSE OFFICER in the Neurological Department. Salary £819 10s. p.a. A charge of £150 p.a. is made for accommodation.

Address written applications, giving full personal particulars and details of experience, &c., together with 2 names and addresses for reference, to W. BOWRING, Group Secretary, Pinderfields General Hospital, Wakefield.

WAKEFIELD. STANLEY ROYD HOSPITAL. Applica-tions invited for post of JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER in Psychiatry. Accommodation available for a single person.

Address written applications, giving full personal particulars, details of training, experience, &c., and 2 names and addresses for reference, to W. BOWRING, Group Secretary, Pinderfields General Hospital, Wakefield.

WALSALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following appointments:—

Manor Hospital (340 Beds)
HOUSE PHYSICIAN.

General (Sister Dora) Hospital (181 Beds)
HOUSE PHYSICIAN.

Recognised for pre-registration.

Applications, together with names of 2 referees, to Group Secretary, Walsall General (Sister Dora) Hospital.

WALSALL HOSPITAL MANAGEMENT COMMITTEE.
Manor Hospital, Walsall

PÆDIATRIC HOUSE PHYSICIAN required 1st August, 1958; recognised for D.C.H., also pre-registration.

Applications, together with names of 2 referees, to Group Secretary, Walsall General (Sister Dora) Hospital.

WALSALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following appointments:—

Manor Hospital (340 Beds)
HOUSE SURGEON.

General (Sister Dora) Hospital (181 Beds)
HOUSE SURGEON.

Recognised for pre-registration.

Applications, together with names of 2 referees, to Group Secretary, Walsall General (Sister Dora) Hospital.

WALSALL HOSPITAL MANAGEMENT COMMITTEE. MANOR HOSPITAL. (333 Beds.) GYNÆCOLOGICAL AND OBSTETRIC HOUSE SURGEON. Post recognised for D.Obst.R.C.O.G. Vacant 1st September, 1958.

Applications to Group Secretary, General (Sister Dora) Hospital, Walsall.

WARRINGTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of SENIOR HOUSE OFFICER (geriatrics) (Male or Female) for active geriatric units at Whitecross Hospital and Aikin Street Hospital, Warrington. Good clinical experience and study time for higher qualifications. Scale of salary £819 10s. p.a., less a deduction of £150 p.a. for residential emoluments.

Applications to be forwarded to HENRY L. BOOT, Group Secretary, c/o General Hospital, Warrington, Lancs.

WARRINGTON INFIRMARY. Applications are invited from Males and Females for the post of RESIDENT CASUALTY OFFICER (graded as Junior Hospital Medical Officer) at the above Hospital. The post is recognised for the F.R.C.S. Scale of salary £852 10s.–£53–£1182 10s. less a deduction of £170 for residential emoluments. A whole-time Senior Hospital Medical Officer is in charge of the Department.

Applications, stating age, experience and qualifications, should be forwarded to—

HENRY L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee,
c/o General Hospital, Warrington, Lancs.

WATFORD. GROUP 9 PATHOLOGICAL LABORATORY. Applications are invited for the post of NON-RESIDENT PATHOLOGIST (Senior House Officer grade). The appointment is tenable for 1 year in the first instance.

Applications with names of 3 referees, should be sent to the Pathologist in Charge, Group 9 Laboratory, 6, Rickmansworth-road, Watford, Herts.

WATFORD, HERTFORDSHIRE. PEACE MEMORIAL HOSPITAL. (211 Beds.) Applications are invited for the post of RESIDENT ANÆSTHETIST (Senior House Officer grade) to the Watford Hospitals. Post vacant immediately.

Applications, together with copies of not more than 2 recent testimonials, to the Administrator.

WATFORD. SHRODELLS HOSPITAL. (General hospital, 366 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER to the Geriatric Unit. Resident or non-resident, to take up duty about July 25th. This unit of 180 Beds, under a full-time Consultant Geriatrician, offers excellent clinical experience in diagnosis and treatment of acute and other illnesses in the elderly. Full laboratory and radiological facilities. Adequate time for reading.

Applications, together with copies of not more than 2 testimonials, should reach the Medical Administrator as soon as possible.

WELSH REGIONAL HOSPITAL BOARD.

REGISTRAR (pædiatrics), Neath General Hospital. Recognised for D.C.H. Resident non-resident.

REGISTRAR in Psychiatry, based Pen-y-Val Hospital, Abergavenny, Mon. Full range of modern psychiatric treatments and a number of associated general hospital outpatient clinics. Resident. Married or single quarters available.

Subject review end of first year.

Application form from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WEST BROMWICH AND DISTRICT HOSPITALS MANAGEMENT COMMITTEE. Applications are invited for the following appointments. Pre-registration.

West Bromwich and District General Hospital (144 Beds)
1 HOUSE PHYSICIAN.

Hallam Hospital, West Bromwich (430 Beds)
2 HOUSE PHYSICIANS.

These posts will be vacant 8th July, 1958.

Applications, with 3 recent testimonials, to Group Secretary, West Bromwich and District Hospital Management Committee, Edward-street, West Bromwich.

WEST DORSET GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. OBSTETRICAL AND GYNÆCOLOGICAL REGISTRAR (Registrar grade) required. Duties mainly at Portwey Hospital, Weymouth (39 obstetrical and 26 gynæcological beds), recognised for M.R.C.O.G. Single accommodation available at the rate of £170 p.a., otherwise must be resident in Weymouth area. Post vacant 1st October, 1958.

Application form, which should be returned immediately, from Group Secretary, West Dorset Hospital Management Committee, Damers-road, Dorchester, Dorset.

WEST FIFE HOSPITALS BOARD OF MANAGEMENT. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (resident) at Glenlomond Hospital, By Kinross (150 Beds—respiratory and non-respiratory tuberculosis). Single or married quarters available.

Applications, giving full particulars of previous experience, should be lodged with the Physician-Superintendent, Glenlomond Hospital, By Kinross.

WESTON-SUPER-MARE GENERAL HOSPITAL. (104 Beds.) Applications are invited from duly qualified medical practitioners for the pre-registration appointment of HOUSE SURGEON (resident). Vacancy 15th July, 1958.

Applications, stating age, qualifications, together with names and addresses of 2 referees, should be addressed to the Secretary, Weston-super-Mare Hospital Management Committee.

WICKFORD (near), ESSEX. RUNWELL HOSPITAL. (1052 Beds.) SENIOR HOUSE OFFICER (Male or Female) required for 1 of the Consultant's Divisions and to assist in outpatient work. Excellent postgraduate facilities for D.P.M. Salary £819 10s.; residential charge £150.

Applications, with copies of testimonials, to the Secretary.

WIGAN AND LEIGH HOSPITAL MANAGEMENT COMMITTEE. WHELLEY HOSPITAL. (71 acute medical beds.) HOUSE PHYSICIAN, pre-registration post.

Applications, with names of 2 referees, to Secretary, Knowsley House, Wigan.

WIGAN AND LEIGH HOSPITAL MANAGEMENT COMMITTEE.

Royal Albert Edward Infirmary, Wigan
HOUSE SURGEON.

Leigh Infirmary, Leigh
HOUSE SURGEON.

Pre-registration posts.

Applications, with names of 2 referees, to Secretary, Knowsley House, Wigan.

WIGAN. ROYAL ALBERT EDWARD INFIRMARY. (200 Beds.) SENIOR HOUSE OFFICER in Orthopædic Surgery.

Applications to Secretary, Royal Albert Edward Infirmary, Wigan.

WINDSOR. KING EDWARD VII HOSPITAL. Resident MEDICAL REGISTRAR required immediately.

Application forms from and returnable to Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 31st July.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An associated hospital of the Birmingham University Medical School.) Pre-registration HOUSE OFFICER (general surgery). Post vacant immediately. Recognised for F.R.C.S.

Apply, giving age and qualifications and copies of 2 testimonials, to the Secretary.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An associated hospital of the Birmingham University Medical School.) Pre-registration HOUSE OFFICER (pædiatrics). Post recognised for D.C.H. Vacant immediately.

Apply, giving age and qualifications and copies of 2 testimonials, to the Secretary.

WORCESTER ROYAL INFIRMARY. (213 Beds.) Locum Tenens HOUSE PHYSICIAN required from 27th July to 10th August.

Applications to Hospital Secretary.

WORKSOP. KILTON HOSPITAL. (185 Beds.) Sheffield REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (obstetrics and gynæcology) required 17th September. Duties also at Victoria Hospital, Worksop (119 Beds). Married accommodation available. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 28th July, 1958, giving age, nationality, qualifications, present and previous appointments with dates naming 3 referees.

WREXHAM. MAELOR GENERAL HOSPITAL (591 Beds) and WAR MEMORIAL HOSPITAL, WREXHAM (230 Beds). Applications are invited for HOUSE SURGEON posts at the above Hospitals, duties to commence on 1st August, 1958. The appointments are recognised for the Diploma of F.R.C.S. (England, Edinburgh and Ireland) and are pre-registration posts.

Applications, stating age, nationality, qualifications, and experience, with copies of 2 recent testimonials, to be sent to the Group Secretary, Wrexham, Powys and Mawddach Hospital Management Committee, Maelor General Hospital, Wrexham, as soon as possible.

YORK. COUNTY HOSPITAL. (266 Beds, general.) 2 Pre-registration HOUSE SURGEONS required for the above Hospital. Posts are vacant now and are tenable for 6 months.

Applications, giving names of 2 referees or 2 copy references, to Group Secretary, York A and Tadcaster Hospital Management Committee, Bootham Park, York, immediately.

YORK. THE RETREAT. Applications are invited for the post of REGISTRAR in Psychiatry (Male or Female). Facilities are available for attendance at the D.P.H. course at Leeds University. Accommodation for single person if required. Salary as in National Health Service scale. Superannuation is transferable to and from the National Health Service.

Applications, with names of 2 referees, should be sent to the Physician-Superintendent, The Retreat, York, within 2 weeks of the appearance of this advertisement.

NEW YORK. NEW ROCHELLE HOSPITAL, New ROCHELLE, NEW YORK, U.S.A. (383-Bed general community hospital.) Approved by the Joint Commission on Accreditation of Hospitals. Also approved by the American College of Surgeons and American Medical Association for Internship and Residency training. Only graduates from approved university schools accepted. Interneships available for the 1-year term commencing 1st July, 1958. Stipend is $200 per month plus complete maintenance.

Apply Superintendent.

CANADA. REGINA GENERAL HOSPITAL, Regina, SASKATCHEWAN. The following vacancies exist for appointments in an 800-Bed hospital, all services very active:—

(1) JUNIOR ROTATING INTERNSHIPS, stipend $150 per month, plus full maintenance.

(2) ASSISTANT-RESIDENTS in Pathology, stipend $200 per month, plus full maintenance.

(3) ASSISTANT-RESIDENTS and RESIDENTS in Surgery, stipend at the rate of $200 per month for Assistant-Residents and $250 per month for Residents, plus full maintenance.

Apply: Superintendent, Regina General Hospital, Regina, Saskatchewan, Canada.

CANADA. THE CHILDREN'S HOSPITAL, Winnipeg, CANADA. ASSISTANT RESIDENCIES in Pediatrics. 2 openings available in fully accredited Pediatric Teaching Hospital of University of Manitoba. Appointment to be made on or before 1st September, 1958, first year Residents (prerequisites: qualification for general practice, and graduation from Grade-A Medical School). Opportunity to complete 3 years' specialty training course for Canadian Certification or Fellowship. Total Interne Staff 18, 13 in Pediatrics. Occupancy approximately 200. Rotation through Winnipeg General Hospital Women's Pavilion for newborn experience. Honorarium $150 per month plus full maintenance and 1 month vacation with pay.

Applicants please write c/o the Superintendent, Children's Hospital, Winnipeg, Manitoba.

IBADAN, NIGERIA. UNIVERSITY COLLEGE HOSPITAL. The Board of Management invite applications from medical practitioners with the necessary experience for appointment as REGISTRARS in the Department of Surgery in the newly completed hospital.

The salary offered for the post is £1164 p.a., plus an inducement allowance for expatriate officers of £270 p.a.

Registrars will carry out normal duties in the wards and will supervise casualty in rotation.

The appointments will be initially for 1 tour of 12 months and will be renewable by mutual agreement for a further tour of 12 months at a salary of £1212 p.a.

On satisfactory completion of the agreement, a gratuity of £37 10s. will be paid for each completed period of 3 months' service.

An outfit allowance of £60 is payable on first appointment.

Partly-furnished quarters are provided at a rental of 8½% of salary, excluding inducement allowance, and an expatriate doctor appointed will be eligible for 7 days' leave on full pay for each completed month of service in Nigeria. A Nigerian doctor qualifies for 5 days' leave for each completed month of service.

Free first-class passages are provided for expatriate doctors and their wives on first appointment, vacation leave and on completion of the agreement. Free first-class passages to Nigeria will, in certain circumstances, be provided for non-expatriate doctors.

Candidates will be eligible for children's allowances in accordance with existing regulations.

Arrangements can be made to enable doctors to continue their National Health Service superannuation scheme contributions and details of the revised salary and gratuity payable in such cases will accompany application forms.

Applications should be submitted not later than 1st August, 1958, on the appropriate forms, which will be forwarded, together with additional information, on receipt of an addressed foolscap envelope by the Adviser on Staff Recruitment, London Office (University College Hospital, Ibadan), 57, Catherine-place, Palace-street, London, S.W.1.

IBADAN, NIGERIA. UNIVERSITY COLLEGE HOSPITAL. The Board of Management invite applications from medical practitioners with the requisite postgraduate experience and qualifications for appointment as SENIOR REGISTRAR in the Institute of Public Health.

The salary offered is £1428 p.a., rising by 3 increments to £1596 p.a., plus an inducement addition payable to an expatriate doctor of £300 p.a.

The successful candidate will be required to assist at a Rural Health Centre at Ilora, about 30 miles north of Ibadan, where antenatal, child welfare, and general clinics are conducted, and research in Rural Health organised.

He will also be required to assist Medical Students in the University College Hospital, in the study of social factors affecting health and in particular relation to the sick in the wards.

The successful candidate will be expected to assume duty about October, 1958.

The appointment will be initially for 1 tour of 12 months and will be renewable by mutual agreement for a further tour of 12 months.

On satisfactory completion of the agreement a gratuity of £37 10s. will be paid for each completed term of 3 months' service.

An outfit allowance of £60 is payable on first appointment.

Partly-furnished quarters are provided at a rental of 8½% of salary excluding inducement allowance, and an expatriate doctor appointed will be eligible for 7 days' leave on full pay for each completed month of service in Nigeria. A Nigerian doctor is eligible for 5 days' leave for each completed month of service.

Free first-class passages are provided for expatriate doctors and their wives on first appointment and on completion of the agreement. Free first-class passages to Nigeria will, in certain circumstances, be provided for non-expatriate doctors. Free first-class passages will be provided for vacation leave.

Candidates will be eligible for children's allowances in accordance with existing regulations.

Arrangements can be made to enable doctors to continue their National Health Service superannuation scheme contributions and details of the revised salary and gratuity payable in such cases will accompany application forms.

Applications should be submitted not later than 1st August on the appropriate forms, which will be forwarded, together with additional information, on receipt of an addressed foolscap envelope by the Adviser on Staff Recruitment, London Office (University College Hospital, Ibadan), 57, Catherine-place, Palace-street, London, S.W.1.

Public Appointments

FACTORY DOCTORS. Factories Acts, 1937 and 1948. The following appointments as Appointed Factory Doctor are vacant. Apply to Chief Inspector of Factories, 19, St. James's-square, London, S.W.1.

District	*County*	*Latest date for receipt of applications*
MULLION ..	CORNWALL ..	9TH AUGUST, 1958
ROSS ..	HEREFORD ..	2ND AUGUST, 1958

LONDON COUNTY COUNCIL. Applications are invited from medical practitioners practising in Wandsworth area under National Health Service for appointment as VISITING MEDICAL OFFICER to Ashmead Home, 201, Cortis-road, S.W.15, for 72 old and infirm people. Remuneration £40 a year plus fees receivable from Executive Council in respect of residents and resident staff who may be on National Health Service list.

Particulars and application form from Medical Officer of Health, (PH/D. 1/1323), County Hall, Westminster Bridge, S.E.1, returnable by 28th July.

BIRMINGHAM. CITY OF BIRMINGHAM. Public HEALTH DEPARTMENT. Applications are invited for the appointment of ASSISTANT MEDICAL OFFICER (Male or Female) for Maternity and Child Welfare. The duties will be mainly in connection with Maternity and Child Welfare as well as the medical aspects of the care of deprived children in the care of the Children's Department. Salary scale £1050–£50 (3)–£55 (5)–£1475 p.a. with placement on the scale according to qualification and experience. Pension scheme (including widows and orphans); medical examination.

Applications, giving full particulars of qualifications and experience, together with names of 3 persons to whom reference may be made, to be sent to Medical Officer of Health, Council House, Birmingham, 3, not later than 26th July, 1958.

GLOUCESTERSHIRE COUNTY COUNCIL. Assistant COUNTY MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER (Male). Must be registered medical practitioner. Possession of a Diploma or Certificate in Public Health an advantage. Salary £1050–£1475 p.a. Superannuable. Medical examination. Car driver and should possess a motorcar.

Application forms obtainable from County Medical Officer of Health, Berkeley House, Berkeley-street, Gloucester, returnable by 2nd August, 1958.

GUY H. DAVIS, Clerk of the County Council.

Shire Hall, Gloucester.

NOTTINGHAMSHIRE COUNTY COUNCIL. Public HEALTH DEPARTMENT. Appointment of Medical Officer. Applications invited from registered medical practitioners (either sex) for the whole-time appointment of SENIOR CLINICAL MEDICAL OFFICER. Salary within the scale £1250 p.a.–£50–£1400–£55–£1510–£65–£1575, subject to a maximum commencing salary of £1400 p.a.

Applicants should:

(*a*) Possess the D.P.H., D.C.H., or comparable qualification.

(*b*) Have had at least 3 years' experience as whole-time Clinical Medical Officer in the Antenatal, Child Welfare and School Health Services of a Local Authority since July, 1948.

(*c*) Have been approved by Ministry of Education for, and have had substantial experience in, the ascertainment of educationally subnormal children.

Application forms and conditions of appointment from the County Medical Officer, County Hall, West Bridgford, Nottingham. Applications by 18th August, 1958,

A. R. DAVIS, Clerk of the County Council.

SOUTHEND-ON-SEA CORPORATION invite applications from qualified Women for appointment as SCHOOL MEDICAL OFFICER AND ASSISTANT MEDICAL OFFICER. The duties of the post are mainly clinical but some administrative responsibility particularly for maternity and child welfare, might be given to a suitably experienced woman. Salary scale £1050–£1475 p.a. In determining the commencing salary proper regard will be given to qualification and experience.

Application forms and conditions of service may be obtained from the Medical Officer of Health, Municipal Health Centre, Warrior-square, Southend-on-Sea.

STAFFORDSHIRE COUNTY COUNCIL. Health Department. Appointment of COUNTY PSYCHIATRIST. Applications are invited from registered medical practitioners with suitable experience to undertake duties involving the day-to-day control of the Mental Health Section of the Department, including Mental Deficiency and Lunacy, together with Child Guidance arrangements of the School Health Service. Practical experience of child guidance work is desirable and the possession of a Diploma in Psychological Medicine will be considered an advantage. The candidate will be on the staff of the County Medical Officer of Health, to whom he will be responsible. The salary scale will be in accordance with the latest Industrial Court Award, i.e., £1520 p.a., rising by annual increments of £50 (1) and £55 (7) to £1955 p.a., and previous similar service may be taken into consideration when deciding the commencing rate. The candidate appointed will be required to provide a car and will be paid allowances in accordance with the County Council's scale. The appointment, which will be terminable by 3 months' notice in writing on either side, will also be subject to the provisions of the appropriate superannuation Acts and regulations, in which connection the successful candidate will be required to pass a medical examination and produce his or her birth certificate.

Applications, stating age, qualifications and experience, together with copies of not more than 3 recent testimonials, should reach the County Medical Officer of Health, County Buildings, Stafford, not later than 31st July, 1958. Canvassing, directly or indirectly, will disqualify, and all applicants must state whether, to their knowledge, they are related to any member or senior officer of the County Council.

T. H. EVANS, Clerk of the County Council.

County Buildings, Stafford. 2nd July, 1958.

KENT EDUCATION COMMITTEE require Assistant COUNTY MEDICAL OFFICERS: (i) Folkestone and surrounding area; (ii) "Excepted" district of Beckenham. Salary in scale £1050–£50–£1200–£55–£1475. Posts superannuable. Duties mainly in School Health and Child Welfare Services. Experience in classification of educationally subnormal children an advantage.

Applications, stating age, qualifications and experience, together with the names of 2 persons to whom reference may be made as to professional ability and character, to Principal School Medical Officer, County Hall, Maidstone.

LANCASHIRE COUNTY COUNCIL. Applications are invited from registered medical practitioners for appointment as ASSISTANT DIVISIONAL MEDICAL OFFICER in the Liverpool area. Possession of Diploma in Public Health desirable. Salary £1050 rising to £1475 p.a. Travelling and subsistence allowances where applicable.

Application forms and further particulars from County Medical Officer, Serial 923, East Cliff County Offices, Preston. Application forms to be returned by 31st July, 1958.

WESTMEATH COUNTY COUNCIL. Resident Medical OFFICERS (2) are required at the County Hospital, Mullingar, for a period of 6 months, subject to extension. Both appointments are now vacant. Salary will be at the approved rate together with rations and apartments. Credit will be given for previous service in a recognised hospital.

Applications should be made immediately to the County Secretary, County Clinic, Mullingar.

YORKSHIRE. COUNTY COUNCIL OF THE WEST RIDING OF YORKSHIRE. Appointment of County Medical Officer of Health. The County Council of the West Riding of Yorkshire invite applications for the appointment of MEDICAL OFFICER OF HEALTH AND PRINCIPAL SCHOOL MEDICAL OFFICER for the County. The salary will be £3285 p.a., rising by 3 annual increments of £105 and 1 of £55 to £3655 p.a. Candidates must not only be duly qualified as prescribed by the Local Government Act, 1933, but must also possess considerable administrative ability and a wide knowledge and experience of the organisation of public health services.

The prescribed form of application with terms and conditions of the appointment may be obtained from the undersigned. Applications on the form provided, together with copies of not more than 3 recent testimonials, should be sent marked "Confidential", not later than 30th September, 1958, addressed to the Clerk of the County Council, County Hall, Wakefield. Canvassing, directly or indirectly, will be a disqualification.

BERNARD KENYON, Clerk of the County Council.

County Hall, Wakefield. July, 1958.

TASMANIA. DEPARTMENT OF HEALTH SERVICES. Applications are invited for 2 posts of whole-time employed PSYCHIATRISTS attached to the Department of Health Services.

Each application should be accompanied by 2 recent testimonials and the names of 2 referees.

Qualifications: Applicants must possess medical qualifications registrable with the Medical Council of Tasmania and preference will be given to applicants holding the D.P.M. or equivalent qualification.

Duties: On appointment, the successful applicants will be seconded for duties at Lachlan Park Mental Hospital and will be responsible to the Director of Mental Health through the Medical Superintendent of the Hospital.

Nature of appointments: The appointments are not made under the Public Service Act. Termination of appointment is subject to 3 months' notice by the appointee or the Director-General of Health Services. No private practice is permitted.

Salary: At the rate of £A3000 p.a.

Accommodation: Furnished residences are available for both Psychiatrists on a rental basis.

Superannuation: Is available.

Leave: 28 days' annual recreational leave is granted.

Inquiries and applications should be lodged with the Official Secretary, Office of the Agent-General for Tasmania, 457, Strand, London, W.C.2.

TASMANIA. DEPARTMENT OF HEALTH SERVICES. Applications are invited from registered medical practitioners for appointment as Part-time PSYCHIATRIST to the Department of Health Services in Hobart.

Qualifications: At least a few years' experience in the practice of psychiatry is essential and the possession of a Diploma of Psychological Medicine is desirable.

The successful applicant will be required to devote 5 sessions per week (each of 4 hours) or the equivalent in clinical psychiatric work in Hobart for the Department of Health Services. The work will include work with both adults and children, the psychotic, neurotic and mentally defective, and court and gaol psychiatry.

This appointment presents a unique opportunity to enable a Specialist in Psychiatry to establish himself in private specialist practice in Hobart, as there is at present no Psychiatrist practising privately.

The appointment will be for 2 years in the first instance. Salary is at the rate of £1500 p.a. 4 weeks' annual leave is granted.

Applications, stating qualifications, experience and personal particulars, together with copies of 3 recent references, should be lodged with the Official Secretary, Office of the Agent-General for Tasmania, 457, Strand, London, W.C.2.

Hospital Services: Non-Medical Appointments

BEVERLEY, EAST YORKSHIRE. WESTWOOD HOSPITAL. BIOCHEMIST, non-medical, basic grade, for Area Laboratory; Whitley scale.

Applications, with details of age, qualifications and experience, and names of 2 referees, to Hospital Secretary.

General Practice

For an **Executive Council post** *(England and Wales) apply on form* **E.C.16A** *obtainable from the council. Mark envelope "Vacancy."*

FELTWELL, NORFOLK. Applications are invited for Rural VACANCY due to death. List approximately 3000 (all dispensing). Residence and surgery available by purchase. "Intermediate" area. Apply on Form E.C.16A, not later than 2nd August, 1958, to:—

R. J. COBB, Clerk of the Norfolk Executive Council.
54, Prince of Wales-road, Norwich.

LAMPETER AND DISTRICT. Applications invited for VACANCY due to resignation. Rural—list approximately 1030. All prescribing. Fair mileage. Residence and surgery accommodation (freehold) available for purchase. Apply on Form E.C.16A before 11th August, 1958, to the Clerk, Cardiganshire Executive Council, Swyddfa'r Sir, Marine-terrace, Aberystwyth.

Miscellaneous

Geigy Pharmaceutical Company Limited. We are seeking a Doctor to head our Medical Department. This is a new position and his duties will, in conjunction with the existing medical staff, cover the arrangement of clinical trials and the provision of information to the medical profession. He will also cooperate closely with the Geigy International Research Organisation in arranging clinical trials of compounds emanating from research. A knowledge of French and/or German would be a distinct advantage, but a wide experience in medicine, both in practice and in the pharmaceutical industry, is a more important qualification. The successful applicant would primarily be responsible for representing the medical and scientific viewpoint in formulating Company policy but, in addition, he must be capable of appreciating marketing problems. The salary paid will be dependent on qualifications and experience, but a generous salary will be paid to the right man. A contributory pension scheme and other benefits are in existence.

Please apply, in confidence, giving full details of qualifications and experience, to the Managing Director, Geigy Pharmaceutical Co., Ltd., Roundthorn Estate, Wythenshawe, Manchester.

R. S. T.

A GENERAL SURGEON

is required for full-time duties by a large copper mine in the

RHODESIAN SELECTION TRUST GROUP

Applicants should be suitably qualified and have broad experience.

The successful candidate will be expected to do surgical work in the company's European and African hospitals and also to perform general medical duties. As the company employs a team of 8 Medical Officers the amount of general medical work would be correspondingly small. The European and African hospitals of the company are modern and well equipped with a total of 400 beds. There are excellent laboratory, X-ray and operating facilities. The mine population catered for is approximately 30,000 Africans and 5000 Europeans.

Salary would depend on qualifications and experience, but would not be less than £2400 p.a. There is also a cost-of-living allowance (currently £70 p.a.). The provisional bonus at 30th June was 13% on basic salary. There are also generous life assurance, pension and share purchase plan schemes.

Free outward passages would be provided for the successful applicant and his wife and family. Leave at 51 days p.a. may be accumulated up to 153 days. In addition up to 7 days local leave may be granted each year.

Married accommodation with basic furniture would be available at a nominal rent. A car would be provided for professional use.

The company's properties are situated in pleasant townships in Northern Rhodesia where there is schooling and excellent recreational amenities. The climate and general health conditions are very good, while the summer is not unduly hot.

Applications giving full personal particulars and details of qualifications and experience (which will be treated in confidence) and indicating earliest date duties could be assumed should be sent to:—

Mine Employment Department,
SELECTION TRUST LIMITED,
Mason's-avenue, Coleman-street, London, E.C.2
(Please quote R.54)

Wanted, private practice or partnership N.H.S. practice with view to succession, London or radius 25 miles. Ample capital for house purchase.—Address, No. 413, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Doctors requiring applications, theses copied: Write to MANTON (WESTMINSTER) LTD., 98, Victoria-street, S.W.1 (VIC. 0141), who are specialists.

Part-time Consulting Rooms to be Let in Harley-street. Rents from £50 per half-day session. Apply: ELLIOTT, SON AND BOYTON, 86/87, Wimpole-street, London, W.1. WEL. 8367.

"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimens of urine and £2 2s. fee. Haematology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

Hypnotism. Will all doctors interested in this subject for Medical purposes please write to the Secretary, British Society of Medical Hypnotists, 126, Harley-street, W.1.

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